





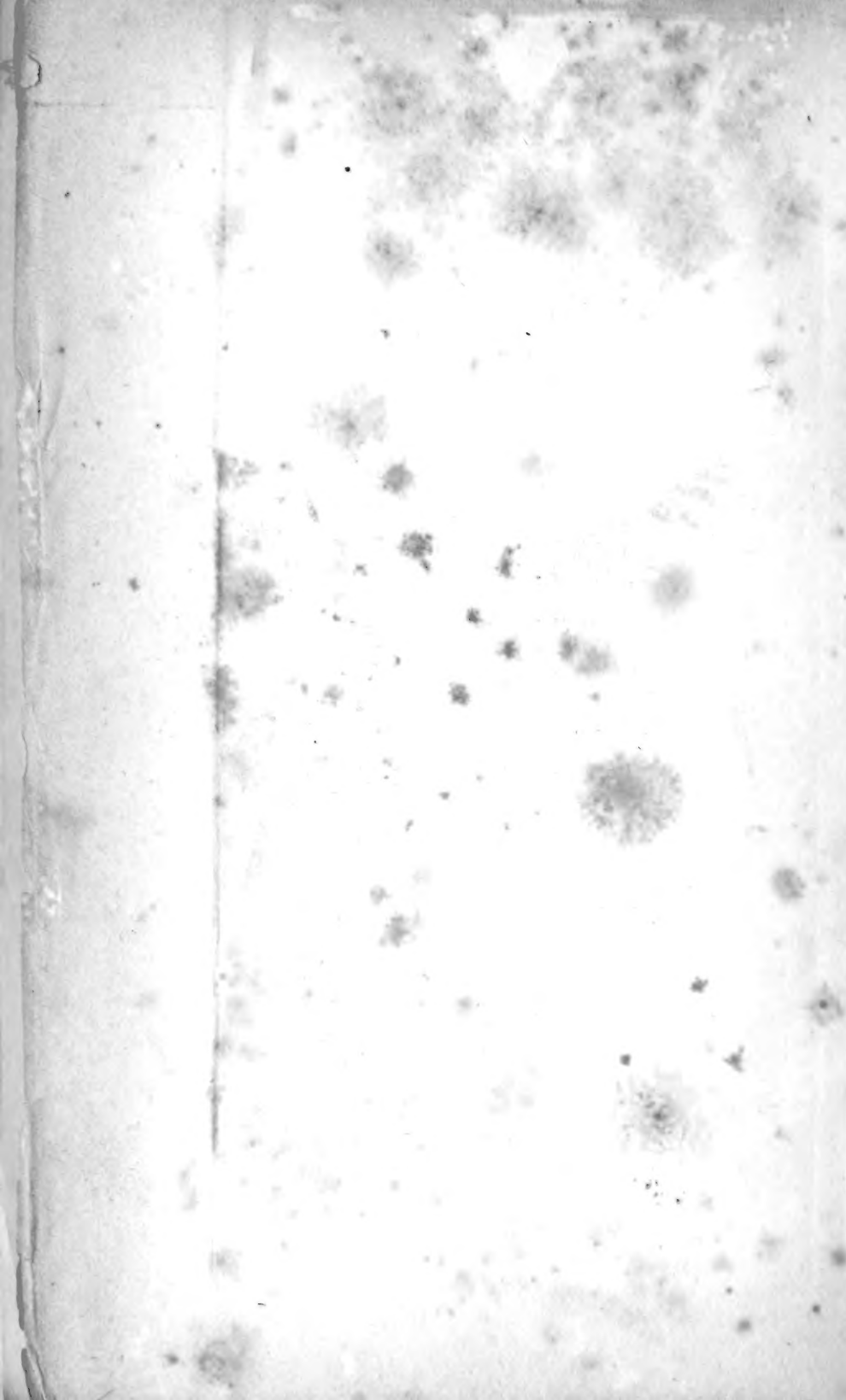
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HINTS

FOR

AMERICAN HUSBANDMEN,

WITH

COMMUNICATIONS

TO THE

PENNSYLVANIA

Agricultural Society.



BY ORDER OF THE DIRECTORS.

PHILADELPHIA :

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1827.

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ORIGINAL NOTICES

ON

CROPS AND MANURES,

BY PRACTICAL MEN.

On the ill effects of soiling Cattle—the total failure of Salt, and the successful application of Bone Dust as manure—the excellence of Mangel Wurtzel and Cabbages as Winter food for live stock—the degeneracy produced by breeding in-and-in—the advantageous results of judicious Crossing evinced in the Turf horse and other breeds. By a Gentleman well known in Great Britain as an enlightened agriculturist, and successful breeder of Neat Cattle and Sheep.

Marion Lodge, near Stockton on Tees,
(England.)

DEAR SIR,—Accept my sincere thanks for your polite and friendly letter, and for your interesting present of the “Memoirs of the Pennsylvania Agricultural Society.” I have read them with great pleasure; they contain much information respecting the state of agriculture in the United States, which is both new and gratifying to me. I rejoice that you are animated by such zeal and spirit for improvement. If the Atlantic did not intervene between us, I would

undertake a journey to see you and your important agricultural improvements. I fear, however, that we shall never meet. I have desired one of my sons, who has a taste for drawing, to make a sketch of one of my cows in her ordinary condition, when heavy in calf, and giving milk, which I now inclose; and I request you to do me the honour to accept it—It will give you a better idea of my stock than any description can convey, although my son has scarcely done the cow justice in the representation. You know that I purchased Mr. Charles Colling's **BEST** cows; and you will be able to form some opinion from this sketch, whether the Short-horns, which have been imported into America, are of the best kind. A change of *bull is indispensably necessary*; FOR "IN AND IN BREEDING" very soon creates degeneracy.

I am deeply sensible of the handsome manner in which you have mentioned my name in the "Memoirs," and of the honour you have done me by inserting my letter. You request me to criticize them, but I do not feel myself competent to point out any defects in your system of agriculture; and the style of the Memoirs merits unqualified praise. The science of agriculture cannot be reduced to any certain and fixed principles like other sciences, on account of the infinite variety of soils, and the difference of climate. Your summers are much hotter and drier than ours, and your winters are more severe. In our summers, the thermometer of Fahrenheit seldom rises to eighty in the shade, and in winter it is seldom much below the freezing point. Here we cannot grow Indian

corn, which is so productive and so valuable. Our climate is perhaps better suited to the growth of turnips, and our pastures in summer are perhaps more verdant and succulent than yours, from the greater moisture occasioned by our insular situation. I have travelled much on the Continent of Europe, and on my return I have always admired the superior verdure of our English pastures. You read much in our English publications of the expediency of *soiling cattle* in the house during the whole of the year. I do not approve of this practice, for it is surely an unnatural one, as air and exercise, and the selection of their own food, must benefit cattle, as other animals are benefited by them. I can say from actual *experience* of the two systems, that cattle *thrive much better* in the fields during the period from the middle of May to the middle of November, than they do when confined in a house. *Soiling cattle* is very little practised in England. We read in some books, that mangel wurtzel is an unwholesome food for cattle, but I agree entirely with you that it is a most valuable and nutritive food. Many of our ablest writers on Agriculture have been theoretical men, and not good *practical* farmers—Hence so many errors in the books. In the “Memoirs” you have inserted an able letter from Sir John S. Sebright, to the late Sir Joseph Banks, on the art of breeding domestic animals. Our best breeds of horses for the carriage, the road, the chase, &c., our cattle, sheep, pigs, and dogs, have all derived their improvement from *judicious* crossing. All the cases of failure have been owing alone to *injudicious* crossing. You know that I

have had long *experience* on these subjects, and have been intimately acquainted with our great improvers of cattle, sheep, and horses.

Many of our writers on agricultural subjects, such as Sir John Sinclair, Mr. Curwen, and many others, have strongly recommended salt as a valuable manure. I have tried the experiment myself, and have seen it tried by others on various soils and in various quantities; but I could never perceive the least benefit. As a condiment for cattle and sheep, it is very beneficial by promoting digestion when used in moderate quantities.

I do not observe in the “*Memoirs*,” any mention of *cabbages* as a winter food for neat cattle and sheep—Perhaps your climate is not favourable to their growth. Here the *large Scotch or drum-headed cabbage* is a most valuable winter food, as it produces a greater weight per acre than turnips. It is peculiarly valuable in some districts, for it will flourish on strong soils which are not proper for turnips. You are so perfectly well informed of the state of British agriculture, that I do not know whether I can give you any new information, unless it be as to the recent use of *bones* as a manure for turnips, and the use in the north of England of the *improved ploughs* made *wholly* of *iron*, without any wood whatever. The bones are first ground to powder in a mill constructed for that purpose, and in a powdered state are sown by the drill along with the turnip seed. Very luxuriant crops of turnips are thus grown without any other manure. Bones have become an article of commerce, and large quantities are imported from various parts of Europe.

I shall always be happy to be honoured by your correspondence, and I remain,

Dear Sir,

Most respectfully yours,

BART'W. RUDD.

P. S.—You have my entire permission to publish this letter.

To John Hare Powel, Esq., Powelton, (U. S.)

Philadelphia County, Feb. 1, 1827.

JOHN HARE POWEL, Esq.

SIR,—I cultivated some acres of woad in the State of Ohio, which I cut six times during the season; it produced about 30 cwt. to the acre, for which I received, when brought to market, $12\frac{1}{2}$ cents per pound, equal to \$420 per acre.

I have been accustomed to its cultivation in England, where I used it for thirty years, as a manufacturer. The soil of America is quite as well adapted, and the climate of the middle, southern and western states, is better suited to its growth, than that of Great Britain. The colouring matter was much stronger—the plant was more vigorous and rapid in its growth, and its product was larger than that to which I have been accustomed in Great Britain.

It prefers a deep, rich, and light alluvial soil—its tap root extends a considerable distance below the surface. Fine tilth is necessary, but it may, like Indian corn, be grown upon a sward reversed. I have found it a better practice to sow the seeds in beds, late in the Autumn, or early in the Spring, if the climate be severe in

winter. When the plants have tap roots about four inches long, they should be set out, at the distance of 8 to 10 inches in rows—sufficiently wide apart to admit either a horse and cultivator, or a ten inch hoe, as the husbandman shall determine, to keep them free from weeds. When the leaves are about 9 inches long, but always before their colour begins to change in any part, they must be cut as spinach with a knife—placed in baskets, and carried into a barn, where they must be chopped forthwith, by means of a chaff cutter, or similar instrument, into pieces of about a quarter of an inch.

So soon as they have been thus prepared, they must be bruised by a roller or bark mill, before they shall have suffered from heating, which a very few hours would cause. The bruised matter must be rolled by the hand into balls of two or three inches diameter, according to the heat of the weather. Care must be taken to expose it *to the free operation of air*, whilst protected from moisture. When dry, it may be stored in heaps.

The subsequent crops may be twisted off, without the use of the knife, as the roots at the latter stages of their growth are sufficiently strong to resist the necessary force to remove the leaves. It may be sown broadcast, but from the extreme lightness of the seeds, great difficulty is found in distributing them equally. In this mode, of consequence, bare patches disfigure the field, and materially affect the amount of its product. The question whether the broadcast or drill system should be employed, must be determined by the relative value of labour and land.

Crops—Guinea Corn—Product.

I shall be very glad to communicate with any gentleman on its cultivation, as its importance to manufactures makes it an object of great interest at this time in America.

One bushel of seeds, if sown in drills, is sufficient for five acres—if sown broadcast, for one acre. It is to be observed, that the woad must undergo the process of *couching*, before it is fitted for the manufacturer.

J. ATHERSTONE.

On Guinea Corn—its cultivation, great product, and value as food for Cattle. By a Practical Farmer.

Guinea Corn has been found a valuable crop in South Carolina. It is believed that the climate of the eastern parts of Pennsylvania is well adapted to its growth. Its product on very rich land is said to exceed an hundred bushels per acre—its weight is greater than that of wheat—its farinaceous matter is exceedingly nutritious—its stalks and leaves are useful as food for cattle. Light alluvion is considered the best soil for its growth. It should be planted and cultivated in rows, as Indian corn. In July the heads appear—in August a part of them become ripe—in the course of September, the principal part of the crop is matured.

The portions which have become mature, are harvested in succession by cutting the stems. They are carried in baskets to a convenient position at the end of the rows—thence to a proper house or barn, where they are stirred occa-

On Woad—its Culture.

sionally until they have become so dry as to be secured against fermentation. An half peck of seeds is sufficient for an acre, if it should be preferred to drill them as turnips. In the early stages of its growth, it appears feeble. After it has arrived at the height of two or three feet it grows vigorously, and becomes hardy as Indian corn.

The success of the crop depends much upon the fertility and preparation of the soil—upon frequent and light stirrings, and proper quantities of manure for the support of the plant.

A FARMER.

On Woad—its culture in Europe.

Woad is a biennial plant usually cultivated on the Continent of Europe, on light soils, reduced to fine tilth, and manured in the preceding autumn. The seeds are sown in March or April, generally broadcast, and are harrowed and rolled as those of grass. Great attention is given to free the land from weeds in previous seasons, and to carefully destroy them as they *appear* during its growth. The leaves are gathered from June till September in the first year, and from June till August in the next, when the plant puts forth its flower stems.

The process by which woad is converted into the state fitted for the manufacturer, requires much experience and minute attention.

I have the honour to be, &c.

JOHN HARE POWELL.

Feb. 1, 1827.

To the President of the Pennsylvania Agricultural Society.

THE HISTORY OF THE

REIGN OF HENRY THE SEVENTH

BY JOHN HALLAM

IN THREE VOLUMES

LONDON: PRINTED BY J. JOHNSON, ST. PAULS CHURCH-YARD, 1795

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BENNETT'S MACHINE.



On substitutes for Hay—Indian Corn sown broadcast on Fallow—its farinaceous product, and value as long fodder.

BY JOHN HARE POWEL, ESQ.

Powelton, Feb. 1, 1827.

The drought of the last Spring so much diminished the crops of hay, that various substitutes were suggested for long fodder. A field was ploughed early in June—part was manured with ashes—part with rotten horse dung—part with bones broken and strewn, at the rate of 250 bushels per acre—the ashes at the rate of 200—the horse dung in quantities equal to 350 bushels per acre.

Upon one acre of the field, three bushels of Indian corn, and a bushel of millet seeds, were sown together—the land was heavily harrowed and rolled. As the millet seeds were bad, and the Indian corn had been a long time thrashed, twice the quantity was sown, which it was supposed would vegetate. The millet seeds principally failed—Not more than a third of the corn appeared above the ground.

Upon adjoining portions of the field, ruta бага, yellow Scotch, and flat red top turnip seeds were sown with Bennett's trough, at the rate of five pounds per acre.

The turnip seeds were lightly harrowed and rolled—the portions of the field so occupied, were in a state of as high cultivation as a garden. When the leaves were about an inch and an half long, all the turnips were harrowed with a light seed harrow. For some time they appeared

feeble, but they revived in forty-eight hours, and grew more luxuriantly than I had hoped.

I caused a line to be stretched along the field, by which a man was enabled to scuffle rapidly, a space equal to twelve inches, as he advanced in a straight direction. The line was removed until rows 6 inches wide were made in succession, throughout the field, leaving the plants as if they had been regularly drilled, thus diminishing the expense of hoeing, which, by American labourers, is little understood.

It will be obviously remarked, they might have been drilled by a regular machine. I had so often been disappointed in growing turnips in drills, from the failure of the plants, that I was determined to secure the crop if practicable, at the expense of the larger quantity of seed. The plants were subsequently thinned.

The ruta бага yielded at the rate of about 400 bushels per acre—neither the yellow Scotch turnips nor white turnips were worth gathering. The Indian corn, although intended to be taken whilst green for long fodder, was allowed to become mature, as it promised to produce much grain. It was cut close to the ground, and bound in the usual mode in small stacks. It yielded thirty bushels of corn—a very large quantity of long fodder, which was estimated at the time, and has since, by the number of cattle which it has supported, been considered equal to two and an half tons of hay. No labour was applied to the Indian corn after it was rolled, until it was gathered.

These experiments with Indian corn, Swedish turnips, yellow Scotch and white turnips, have

Substitutes for Hay—Indian Corn broadcast.

confirmed the opinions I have held, that turnips are not profitable in an Indian corn country, except with particular objects—more especially, as in this climate mangel wurtzel supply, at much less cost, the purposes which they are intended to meet.

I have the honour to be, &c.

JOHN HARE POWEL.

To the President of the Pennsylvania Agricultural Society.

On substitutes for Hay—Indian Corn sown broadcast on Rye stubble and sward—its product and value.

BY JOHN HARE POWEL, ESQ.

Powelton, Feb. 1, 1827.

After a rye crop had been taken, the richest part of the field was ploughed—yellow Scotch and white turnip seeds were sown with Bennett's trough, and were managed as before.

One acre of the same field was at the same time ploughed—four bushels of Indian corn were sown and ploughed under, with a very shallow furrow—an adjoining acre, which had not been previously ploughed, was sown with the same quantity of the same corn, which was in the same manner ploughed under with the stubble—it was all harrowed and rolled. The land had been limed five years since, and was in fine tilth. The turnips failed entirely—the corn vegetated regularly—covered the ground thickly, and put out tassels when five feet high. It was mown when in full blossom—treated exactly as hay; but from the succulence of the stalks, it required much

more time and attention, before it could be housed.

I found my cattle to-day contending for it eagerly, when portions of it were thrown before them in the midst of the *most fragrant* clover hay. The quantity was estimated at two tons per acre.

Upon another field, which, after having been fifteen years in common, was manured with oyster-shell lime at the rate of an hundred bushels per acre, I caused six bushels of corn to be sown immediately after the sward and lime had been reversed. The land was harrowed closely, and heavily rolled—the crop was mown and managed as that of the last field—its product was estimated at two tons and an half per acre.

In another part of the same field, manure taken *fresh* from the stable, was spread upon sward which had been limed as in the last instance. About three bushels of Indian corn were sown on the dung, and were ploughed under with the sward, which was after harrowed and rolled. Fewer seeds were used, as it was supposed the manure would cause most of them to vegetate vigorously.

This piece of land, although much shaded by a close row of trees on its southern boundary, produced more abundantly than the last. It was cut and managed as before. I am inclined to believe from the results of all these experiments, that four bushels of corn in that state of soundness, in which it is usually found after having been thrashed some months, is the proper quantity, or that three bushels from selected ears, would be sufficient. It must be observed, that

Millet—its value as long Fodder.

the latter part of the season was unusually favourable to the growth of Indian corn.

I have the honour to be, &c.

JOHN HARE POWEL.

To the President of the Pennsylvania Agricultural Society.

On substitutes for Hay—Millet, its value as long fodder—its injurious effects when cut late.

BY JOHN HARE POWEL, Esq.

Powelton, Feb. 1, 1827.

Notwithstanding the success in the experiments with Indian corn, I should prefer millet as a substitute for hay, and I should have last year employed it, if I could have procured seeds of good quality. I have obtained, in various seasons, three tons of millet per acre—and in one, much more than that quantity, so far as it could be estimated by weighing one load, and keeping an accurate account of the rest of equal size.

I cultivated thirty acres of millet in 1823, and I should cultivate an equal quantity again, to supply the deficiencies occasioned by the failure of the young grass, of the preceding year.

I am not disposed to consider it a substitute for Indian corn as a farinaceous crop, for obvious reasons, which I have explained at length. Mr. Dupont, of Delaware, has cultivated it extensively, and continues to entertain the highest opinion of its value. I am not aware of any evil attending its use as long fodder, except when it has been allowed to become ripe; some danger is then to be apprehended to neat cattle, from swallowing the grain unbroken, which, adhering

Remedies for injudicious Feeding.

closely in the stomach, cannot be ejected for the purpose of rumination—in one instance I have known it to cause death. Similar effects are sometimes produced by feeding cattle upon Indian meal, without *mixture* with cut hay or straw. The animal having been tied in a stall, and tempted to consume as much as possible—the system is made sluggish by the want of exercise—the stomach loaded with fat, becomes unable to perform its office—the indigestible meal coheres, causes sometimes apoplexy, and always injury to the beast.

Graziers, feeders, and dairy farmers, have various appellations for the diseases, with which their animals are assailed; and if the nostrums and hard names which cattle doctors have given in English books were to be regarded, the maladies of neat cattle might be considered almost as numerous as those of our own race—whereas in fact they are very few, exhibiting in different stages various symptoms, in most cases to be ascribed to sudden changes of temperature—to bad management—to external injuries and excess, or deficiency in the supply of food. Free circulation of air—due proportions of succulent and dry food—regular exercise, with protection merely *from wet*, are the best preventives—copious bleeding—large and repeated doses of Glauber salts in molasses and warm water, followed by castor oil and sulphur, are generally the best remedies for disease.

I have the honour to be, &c.

JOHN HARE POWELL.

To the President of the Pennsylvania Agricultural Society.

*European practices inapplicable in America—on
Manures, recent and old—Composts, their ap-
plication and cost.*

BY JOHN HARE POWEL, ESQ.

Powelton, Feb. 1, 1827.

I have long contended that British practices or European systems of husbandry, can seldom be profitably applied upon American farms. In no instance, I am led to apprehend, is this remark more just, than in the preparation and use of animal manures. Compost heaps, and the various compounds which have been suggested in Europe as substitutes for the common offal, with which most *well regulated* American farms *may* be brought to abound, I conceive it unwise to employ, in a country where the relative prices of labour and land are in ratios, inverse to those which have given rise to expedients, incompatible with our circumstances, and ruinous in a climate marked by the extremes of heat and cold.

It has been alleged, that where old grass lands require top dressing, composts become the most effective and cheapest manures. I am prepared to admit, that a compost heap which can be obtained without *much labour* or expense in *its preparation*, should always be regarded as an important item in the economy of the farm. The commixture of earth, animal matter, green weeds, or other vegetables, should never be neglected, provided they be at hand—but I am assured they should not be "*manufactured*" by re-

peated moving, but should be left to the operation of heat and moisture, until they can be employed, and if practicable, be *incorporated* intimately with the soil.

Recent animal manures I have always considered the most effective and the most lasting, whether they be applied to the surface, or be turned under by the plough.

Parts of my grass lands have been, during several years, subjected to a variety of experiments, which have confirmed the opinions I advance. In March, 1824, I caused "*long dung*" to be spread upon a field of fifteen acres, adjoining one of the same extent, upon which equal quantities of rotten manure had, early in the Autumn, been strewed. The field was harrowed—the long straw was collected by an horse rake—was returned to the barn yard early in May, and placed in the bottom of a deep trench, where it was saturated with the water escaping from the stables and dung heaps on the margin of the fold. The land upon which the recent dung had been spread, produced certainly much the larger crop of grass. In 1825, similar experiments were made by putting rotten manure in the Autumn, and fresh manure in the Spring, upon equal parts of the field, to which the rotten manure alone had been applied in the Autumn of 1823—similar results were obtained.

In the last year the same experiment was tried by covering portions of the other field with old manure in the Autumn, and a part with long dung in the Spring—the results were as they had been before.

The straw having been soaked and bleached by exposure, was loosened by the harrow—collected by an horse rake, and after was used throughout the summer, as litter for bulls, which are necessarily confined upon a breeding farm.

The crop of grass, in despite of the extraordinary drought, much exceeded any which I have ever had from the same land.

I have the honour to be, &c.

JOHN HARE POWEL.

To the President of the Pennsylvania Agricultural Society.

On Meadow Lands—Ill effects of close feeding at certain seasons—Advantageous results of repeated experiments in protecting the soil by after grass—Its value and use.

BY JOHN HARE POWEL, ESQ.

Powelton, Feb. 1, 1827.

Long experience in the management of alluvial meadow had induced me to believe that the injuries apparent after a succession of hay crops, proceed not so much from the effects of the scythe, as from the continued and close feeding, which has generally been practised in this county by *tenants* who occupy much the larger portion of the marsh land.

It was supposed, that the extreme heat and drought, which generally succeed the season, at which the first crop is taken, are particularly injurious to grasses upon such soils.

I caused a grazing farm of nearly an hundred

acres of alluvion, which had been subjected to every evil which the cupidity of the tenant could produce, to be mown for hay, at the time when the grass was in full bloom. No animal was allowed to feed upon it until the latter part of October, when its luxuriant pasturage afforded a larger return than I could have obtained, had the usual system been observed, in depasturing it throughout the term of the greatest heat.

In the succeeding year, the same practice was observed with similar success. The land was evidently improved, and has since commanded higher rent, although the price of meadow land has not generally increased.

I have the honour to be, &c.

JOHN HARE POWEL.

To the President of the Pennsylvania Agricultural Society.

On Grass Lands—Clover—Sowing, &c.

BY JOHN HARE POWEL, ESQ.

Powelton, Feb. 1, 1827.

It is admitted, that in our climate, one of the most difficult items of the husbandman's art, is the successful "*laying down*" of grass lands. Without adverting to the necessity of fine tilth—the fit state of the soil, and proper selection of seeds, I would suggest that not more than half of the proper quantity, whether of clover, orchard grass, timothy, or herd's grass, is usually sown upon American farms.

In England, where clover is less injured by drought in the early seasons of its growth—by

heat when the crop is removed—or by the effects of frost, succeeded by sudden thaws in the Winter and Spring, a peck of clover, mixed with a proportionate quantity of other grass seeds, is usually sown upon an acre of land.

In this climate I have found three half pecks of clover seeds, when combined even with two bushels of orchard grass seeds, in no instance too much for one acre of land.

Light harrowing, and rolling of the grain crop, *if the weather and soil be in a proper state*, immediately after the grass seeds are sown, I have always considered the best mode of securing their vegetation, as well as the best means of *improving the grain*.

It has often been recommended to harrow in August with a heavy brake, and to sow again those parts of the field which appear bare of grass after the crop of grain has been removed. I have never succeeded in the attempt, except when small quantities of manure were soon after scattered over the parts, which had been so treated, and in such cases I have never failed.

I am inclined to believe, that autumnal top-dressing, *with long manure*, may with great profit be applied to protect the *young clover*, especially if the improvident husbandman has allowed it to be fed closely, by horses or sheep.

In addition to the great advantage arising from the stalks of the hay being finer and more valuable as food, an important object is attained by using abundant supplies of seed in our climate. The land being more closely covered with the larger quantity of plants, is not so much exposed

immediately after the crop has been taken, and of consequence is less exhausted during the season of greatest heat, by the rays of the sun.

I have the honour to be, &c.

JOHN HARE POWELL.

To the President of the Pennsylvania Agricultural Society.

On Grasses—Substitutes for Red Clover—Lucerne—Saintfoin.

BY JOHN HARE POWELL, Esq.

Powelton, Feb. 1, 1827.

We have long sought a substitute for red clover, and notwithstanding the efforts which have been made for the introduction of Lucerne and rye grass, I am disposed to think that the agriculturists of America have been generally inattentive to this important subject, involving both the support of our live stock, and to a great extent, the manure for our fields. Lucerne requires more labour and accuracy of tillage than most farmers in this state have either the means or the disposition to apply. Its principal use is in soiling, which no husbandman in Pennsylvania, notwithstanding all that has been written or said, has ever systematically pursued throughout a succession of years.

Rye grass has not succeeded in the few instances in which I have known it tried.

Saintfoin has been neglected, most probably, in consequence of the failures proceeding from the age of the seeds—they seldom vegetate when

more than a year old, and hence fail when they have reached us in the *common* course with *dealers'* supplies.

It is found in various parts of Europe—in Germany—Switzerland—England and France. It is considered one of the most valuable sorts of herbage which can be cultivated on dry soils. Its long root insinuates itself to a great depth in gravelly and rocky lands. Its stems and abundant leaves afford succulent pasturage, as well as excellent hay. Deep calcareous soils are preferred for its growth. If the ground be prepared by *very deep ploughing and proper cleansing crops*, the product is unusually great.

Its hardness in resisting the effects of frost and drought, would render it peculiarly useful in American husbandry. It should be sown as early as practicable in the Spring, with half the usual quantity of barley or oats. Four bushels are the proper quantity of seeds for an acre. Their quality may be known by the brightness of the capsules, the fulness of the kernels, and by their colour, which should be blue-grey or yellowish-red. As the seeds are large, and are enveloped by thick capsules, they *must be covered at greater depth, and with more than usual care*. The roller should be applied, if the soil and weather be in proper state.

The price in England is from five to six shillings sterling per bushel. Saintfoin is managed as clover, to which it is equal in nutrition and product. It affords valuable after grass, which, it is to be lamented, our husbandmen too much disregard as the means of saving fodder, and

keeping their breeding ewes until the season of greatest trial, on the approach of the Spring.

This valuable plant continues during nine or ten years in the soil. My attempts to cultivate it have not been successful, as all the seeds which I had procured were old and did not grow. I abandoned Lucerne, as it required more labour than I was disposed to apply.

I have the honour to be, &c.

JOHN HARE POWELL.

To the President of the Pennsylvania Agricultural Society.

On Orchard Grass—Manner of cultivation—securing the seeds—Quantity sown—Season and mode—Causes of failure—Product and value for pasturage and hay—its nutritive qualities, and superiority over timothy, both when green and dry.

By LOYD JONES, Esq.

Montgomery County, (Pennsylvania,)

February 5th, 1827.

DEAR SIR,—I have cultivated orchard grass for five and twenty years. My crops failed from the bad quality of the seeds, until they were secured by myself. When they are in the state at which they can be shaken from the heads, the stems are cut by a skilful cradler just above the tops of the under grass. After some practice, he is enabled to catch with his left hand the portions taken by the cradle, and to place them regularly as he advances. They are immediately bound in sheaves large as a man's leg. Double

swarths are afterwards mown with a naked scythe to remove the under grass, and leave at proper distances throughout the field, openings upon which the sheaves are shocked. They remain in this state from eight to ten days, until sufficiently dry to be carried to the barn, where they are forthwith thrashed to guard against heating, the great source of injury to the seeds of this valuable crop. The usual manner of securing them, by putting the sheaves into the mow, is, I am satisfied, the most effectual mode to destroy the principle of vegetation, as they can rarely be so treated, without being mow-burned.

After having been thrashed, they should be strewn upon the barn floor—occasionally stirred if the quantity be large, during eight or ten days, until they are perfectly dry—without this precaution they would inevitably be heated.

The under grass should all be mown for hay, as soon as possible, after the seeds have been harvested. If it be allowed to stand but for a few days, it loses its nutritive properties—in fact dies, after having lost the heads. The hay thus made, and properly secured, although necessarily harsh from having been allowed to pass the stage of its growth when most succulent and nutritious, I have found good fodder, for both horses and neat cattle.

The product of seeds varies from ten to twenty bushels per acre. I have had in a very favourable season, twenty bushels upon land which would not have afforded, I think, ten of wheat. The product of this, as of all crops, depends much, of course, upon the season, and the pre-

paration of the land. The crop to which I advert, was purposely grown upon a poor soil, to show the excellence of the plant, and the fallacy of the assertion, that it required very rich land.

I sow from eight to ten quarts of clover seeds, and a bushel of orchard grass seeds per acre in February, upon wheat or rye land. I should prefer their being sown with oats or barley, as the seeds could be covered more regularly with the harrow, and their vegetation would be secured. I do not apprehend injury from frost in early sowing, but I dread the effects of drought from late. I have never suffered from early, but have generally had cause to regret the evils of late sowing.

I consider orchard grass the best herbage for pasturage upon *upland*—for hay it certainly cannot be excelled.

I cultivated timothy for many years. As pasturage it is utterly worthless after the first of July, upon upland. Timothy hay is valuable for turf horses, and those used in quick draught—but for the purposes of farmers, I think it should not be raised. I have long since discontinued its growth. It is a great exhauster, and should never be cultivated, unless it can be carted to market, and be replaced by large supplies of manure.

I am, very obediently, &c.

Yours,

LOYD JONES.

JOHN HARE POWEL, Esq.,

Powelton.

*On Grasses—Orchard or Cocksfoot—Timothy
and Red-Top, or Herds-grass—their compara-
tive values for Pasturage and Hay.*

BY JOHN HARE POWEL, ESQ.

Powelton, February 10, 1827.

In presenting Mr. Jones' communication, it is not necessary that I should advert to his accuracy and reputation as a farmer, with which you are sufficiently acquainted, to receive his opinions and statements, with implicit reliance upon their validity and force. He is the most successful cultivator of orchard grass, with whose practice I have become acquainted in any part of the United States.

As he has detailed his mode of securing the seeds, I may be allowed to state, that I have for several years induced him to send large quantities of them to my agricultural friends, whose experience, in confirmation of my impressions, that when *properly* treated they seldom fail, establishes the correctness of his management in collecting them.

I have before brought to your notice the extraordinary product of cocksfoot or orchard grass as pasturage upon *strong* soils—its early appearance in the Spring—its vigorous and rapid growth throughout the Summer and Autumn, affording even in December, the most succulent and nutritive herbage I have in this climate seen.

Of timothy as pasturage, I have had during twenty years, opinions similar to those conveyed by Mr. Jones.

On highly manured, or deep alluvial soils, it produces greater crops of hay, than any

grass I have grown, except red clover. Mr. Welles, of Boston, a few years since obtained four tons of timothy hay per acre, from a large field. His well known precision, independent of the ample proofs he adduced, sufficiently establishes the fact. When allowed to become *mature*, I think it causes as much exhaustion as a crop of Spring barley or oats. And so far from land becoming better, whilst exposed to the effects of the scythe, and the rays of the sun in a regular course, wherein timothy is introduced as the meliorating crop, I am led to believe that it is made worse. If timothy be depastured after the first crop has been taken, I apprehend that, as its after growth is extremely feeble, in this climate, the sun must have great effect upon the soil, throughout the hottest season of the year.

Red-top or herds-grass has recently been brought more into notice, and it will, I have no doubt, be extensively cultivated, when it shall have been better known. We see it generally upon the ill reclaimed marsh lands of an adjacent state, where perhaps its extraordinary hardiness and large product, even under the most slovenly management, may have retarded to a certain extent, the improvement of the district in which it is principally grown. It will flourish where no other grass, which *we* cultivate, can live. Its apparent qualities, and the quantity of nutritive matter, are no doubt very much influenced by the state of the land upon which it is produced; hence when offered in the market in competition with the produce of the *most highly cultivated upland*—it is condemned. The seeds of this grass, as those of cocks-foot, are rarely brought to the shops in a sound

Grasses—Herds-grass—its tough and close Sward.

state—they, as the former, are surrounded by chaff, which, if closely examined, will be found frequently to envelope shrivelled kernels, and to be infested with some of the most noxious weeds with which a farmer can contend.

Upon a small piece of land which had been occupied by Swedish turnips, and had been carefully tilled for many seasons in succession, two bushels of herds-grass seeds per acre, in addition to the usual quantity of clover and timothy seeds, were sown with Persian barley in the Spring of 1820. A much larger piece was sown at the same time, with timothy alone. The timothy soon disappeared from both—the clover of course long since *went out*—the herds-grass has formed a tough and valuable sward.

Upon arable farms it is sometimes troublesome, as it is tenacious of life as blue grass. Its product is not generally heavy upon such lands, and I should not therefore cultivate it with a regular course of white crops, although upon a grazing farm, or upon some large southern domains, where it would be well that the landholders should forget half their possessions, it might be expedient to cultivate it largely, and obviate the necessity of indulging the fattening bullocks with a regular ramble for the solace of their stomachs, throughout some hundred acres of growing Indian corn. The herds-grass has the great merit of being able to take care of itself.

I have the honour to be, &c.

JOHN HARE POWELL.

To the President of the Pennsylvania Agricultural Society.

SINCLAIR'S

HORTUS GRAMINEUS WOBURNENSIS.

EXTRACTS.

On Grasses—Orchard—Rye—Clover—Sainfoin, &c.—their products, comparative values, constituent parts, modes of sowing, managing—quantity, quality of Seeds, and adaptation to particular Soils.

In some plants there is a comparative excess of saline matter, and when such plants are given unmixed with any other to cattle, they are most subject to disease, or continue for a length of time before they improve, however abundant the supply. The following facts, which came within my own immediate observation, may serve as an instance to point out the importance of a mixture of such grasses as possess some difference in the qualities of their nutritive matter; and at the same time they will show, that the bitter extractive is efficacious in correcting the over-succulency, or laxative nature of green food, without the aid of dry vegetable fibre.

Two fields were sown down for pasture; one with white clover and trefoil only, and the other with a variety of the natural grasses, for experiment, with a portion of white clover. The two fields were depastured with sheep. In the enclosure of white clover a considerable quantity of cocksfoot grass grew on the edge of the fence: it was of a very harsh quality, from its unfavourable situation, and consisted almost entirely of culms. In a few days the sheep went to this grass, and ate it down entirely, though there was a profusion of the white clover. In the course of time many of the sheep became affected with the disease termed *red-water*, of which several died. But in the adjoining field, which contained the natural grasses, *cocksfoot* grass, rough-stalked meadow grass, rye-grass, foxtail-grass, and white clover, the sheep were not affected with that, nor any other disease, and they left untouched the stems of the cocksfoot, which were here of a more tender succulent nature, than those on the edges of the other field, which were so greedily devoured by the clover sheep.

It may remain only to observe, that if the hard stalks of the cock's-foot in the clover field had been in sufficient quantity, they would most probably have prevented the disease from attacking the sheep; but this could not have been by virtue of the *dry fibre* only of the culms, because in the adjoining field, where every thing was contrary to disease, the sheep rejected the culms altogether. The dry, or mechanical action of the culms, was here wanting; yet the animals continued healthy, and fattened, because the bitter extractive was in greater proportion in the leaves or herbage than in the culms which they rejected: and also proved beneficial, though combined with succulent food, which could have nothing of the action of the dry hay or straw before mentioned.

The proportional value which the grass at the time of flowering bears to that at the time the seed is ripe, is as 11 to 10: and to the grass of the latter-math, as 5 to 2.

There has often been occasion to observe, that though grass, when left till the seed be ripe, may afford a greater quantity of nutritive matter, nevertheless the value of the latter-math which is lost by this means is often greater than the extra quantity of nutritive matter thus obtained; add to this the impoverishing effects of the plants on the soil by the process of ripening the seed, and the less palatable nature of the hay. The plants of grass are likewise much weakened by the production of seed, for in all the experiments I have made the produce of latter-math proved always less, in many instances one-half less, in a given time after the seed crop, than after the crop taken at the time of flowering; I never could perceive, however, that the bad effects

Grasses—Rye—Cocksfoot, &c.—their comparative values.

extended in any degree to the next following season; the weight of produce being then as frequently superior as equal or less.

Rye-grass appears to have been cultivated previous to the year 1677; besides which, red clover, sainfoin, spurrey, trefoil, and nonsuch, were the only plants then cultivated as grasses, or termed such. And it is only of late years that any other species of the natural grasses has been tried as a substitute for it in forming artificial pastures—as cat's-tail grass (*Phleum pratense*); cocksfoot grass (*Dactylis glomerata*); and fox-tail grass (*Alopecurus pratensis*). The cat's-tail grass appears to have been made trial of before either of the other two, not more than fifty years ago, by Mr. Rocque, a farmer at Walham-green, near London. The seed of the cocksfoot grass was introduced about the same time from Virginia, by the Society of Arts, &c., but no trial was made of it till several years afterwards: it was then called orchard-grass; and it is but lately that the fox-tail grass has been tried on an extensive scale—the merits of which seem to have been first accurately pointed out by the late excellent Mr. Curtis in his several works on grasses.

There has been much difference of opinion respecting the merits and comparative value of rye-grass. It produces an abundance of seed, which is easily collected and readily vegetates on most kinds of soil under circumstances of different management; it soon arrives at perfection, and produces in its first years of growth a good supply of early herbage, which is much liked by cattle. These merits have, no doubt, upheld it till the present day in practice, and will probably, for some time to come, continue it a favourite grass with many farmers. But the latter-math of rye-grass is very inconsiderable, and the plant impoverishes the soil in a high degree if the culms, which are invariably left untouched by cattle, are not cut before the seed advances towards perfection. When this is neglected, the field after midsummer exhibits only a brown surface of withered straws.

Let the produce and nutritive powers of rye-grass be compared with those of the cocksfoot grass, and it will be found inferior in the proportion nearly of 5 to 18; and also inferior to the meadow fox-tail in the proportion of 5 to 12; and inferior to the meadow fescue in the proportion of 5 to 17. In these comparisons, from which the above proportions arose, it was necessary to omit the seed crops for the truth of comparison. * * *

Cocksfoot grass perfects an abundance of seed, and the plants arrive at a productive state as soon as those of rye-grass; hence its superiority over rye-grass, as above, is equally great for permanent pasture and the alternate husbandry; which is not so precisely the case with the fox-tail grass and meadow fescue. One peck of rye-grass, with 14 lbs. of clover, per acre, is generally considered sufficient for sowing artificial pastures. * * *

The proportions in which the seeds of the different species should be mixed for permanent pasture:—

Cocksfoot grass (<i>Dactylis glomerata</i>)	- - - - -	2 bushels.
Meadow-fescue (<i>Festuca pratensis</i>)	- - - - -	2
Meadow fox-tail grass (<i>Alopecurus pratensis</i>)	- - - - -	2
Rough-stalked meadow-grass (<i>Poa trivialis</i>)	- - - - -	2
Tall oat-like soft-grass <i>Holcus avenaceus</i>	- - - - -	0½
Meadow cat's-tail (<i>Phleum pratense</i>)	- - - - -	15 lbs.
Hard, or smooth fescue (<i>Festuca duriuscula</i> , vel <i>glabra</i>)	- - - - -	2 bushels.
Crested dog's-tail (<i>Cynosurus cristatus</i>)	- - - - -	1
Nerved meadow-grass (<i>Poa nervata</i>)	- - - - -	0½
Wood meadow-grass (<i>Poa nemoralis</i>)	- - - - -	1
Narrow-leaved meadow-grass (<i>Poa angustifolia</i>)	- - - - -	0½
Broad-leaved creeping bent, or florin (<i>Agrostis stolonifera</i> , var. <i>latifolia</i>)	- - - - -	0½
Rye-grass (<i>Lolium perenne</i>)	- - - - -	1
White or Dutch clover (<i>Trifolium repens</i>)	- - - - -	15 lbs.
Bush vetch (<i>Vicia sepium</i>)	- - - - -	0½ bushel.
Sweet-scented vernal grass (<i>Anthoxanthum odoratum</i>)	- - - - -	0½
Perennial red clover (<i>Trifolium pratense perenne</i>)	- - - - -	12 lbs.
<i>Achillea millefolium</i> , yarrow	- - - - -	4

Grasses—Seeds—quantities and modes of sowing.

The proper quantity of grass seeds to sow, per acre, is a point of the greatest importance, as regards the expense of the seed, and the speedy formation of the most valuable sward. * * * * *

When land is to be sown for permanent pasture, no admixture of any annual or grain crop, or broad-leaved clover, should be admitted with the grass seeds. Experience proves that they are highly injurious to the intention of speedily forming a solid productive sward; and that the profit that may accrue from a grain crop thus obtained, will be much overbalanced by the loss of grass in the two following seasons. Every plant of these annual crops occupies a place, to the detriment of the expected sward; besides rendering the surface porous by the decay of their roots in the end of autumn, much mischief, likewise, is done to the sward by portions of the crops being beat down with heavy rains. The above mixture should be sown in the autumn or spring, at the rate of four bushels and a half to the acre; much less will form a good pasture, but when the seeds can be had from the farm at a moderate expense, the maximum quantity should be adopted. If sown in spring, it will be found highly useful, in the following autumn, to give the surface a slight top-dressing with rotten dung or compost, in which the seeds or roots of weeds are not suspected, and to sow immediately after half a bushel, more or less, of the mixture of seeds, according as the sward appears to be deficient of plants; after which, (the top-dressing being previously well reduced by a slight bush-harrow,) the roller should be liberally used; and *rolling*, for the first two years, should never be neglected at any favourable opportunity. If the seeds are sown in autumn, the top-dressing, re-sowing, and rolling, will be found equally requisite and beneficial in the following month of May; and even if repeated in the following autumn, they will greatly forward the intention. This is imitating the process of nature in forming pastures—with this advantage, that for one seed of a valuable species of grass supplied to the soil by the slow and gradual process of nature, in one season, a thousand are supplied in the same space of time; and thus take possession of their natural soil, without the danger and inconvenience of expelling its usurpers.

There has been some difference of opinion respecting the manner of reaping the produce of seedling grasses; whether by depasturing with sheep, or by moving after the plants have perfected their seed. The manure supplied by sheep to the young grasses is of great advantage; but the animals are apt to bite too close to the root, and sometimes tear up the young plants altogether. I have found, on repeated trials, that cropping seedling grasses before they had produced flowers, had the effect of retarding and weakening the after-growth of the plants for that season very much. But after the period of flowering, cropping was found to strengthen, and rather encourage the growth of plants. In the same way I found, that old plants of grass, when cut very close after the first shoots of the spring made their appearance, afforded about one-third less weight of produce in the whole season than those plants of the same species which were left uncut till the flowering culms began to appear. As the advantages of the manure of the sheep may be supplied by top-dressing, and the disadvantages resulting to the tender seedling plants from early and close cropping cannot so speedily be removed, the practice of suffering the grasses to produce flowers before they are cut, with the application of top-dressings, and the use of the roller, till the spring of the second year, appears to be far more profitable than the former practice of depasturing the seedling grasses at an earlier period than the spring of the second year. But in this, no doubt, as well as in other particular modes of management recommended for general practice in the culture of plants, local circumstances may interfere so much as often to render some modification of them necessary.

The superior value of sainfoin for soils on a porous or dry sub-soil is therefore manifest. * * * * *

Sainfoin grows wild in all the chalky districts in England; but it was first introduced to English farmers as a plant for cultivation from Flanders and France, where it has been long cultivated. Parkinson, in the year 1640, says, that it is "generally known to be a singular food for cattle, causing them to give store of milk."—Worlidge, in his *Mystery of Husbandry, &c.* (1681), treats of sainfoin at large: "In Wiltshire, in several places," says he, "there

Grasses—Sainfoin—its habits and quantity of nutrition.

are precedents of sainfoin that has been there twenty years growing on poor land, and has so far improved the same, that from a noble per acre, twenty acres together have been certainly worth thirty shillings per acre, and yet continues in good proof."—These extracts show the high opinion which was entertained of this plant above one hundred years ago; but this was, no doubt, in a great measure owing to the small number of plants then known for sowing in the farm.

The experiments that have here been made on this plant were confined to a clayey loam and a light siliceous soil. Upon these it was evidently inferior to the broad-leaved and perennial red clover; but on chalky and gravelly soils there have been abundant proofs of the superior value of sainfoin. After the ample details of the uses and cultivation of sainfoin, given in Mr. Young's Annals, it will be difficult to add any thing new. It is a perennial plant, and produces but little herbage the first year, and on that account should not be sown on land that is intended to remain only two years under grass. In Mr. Young's Annals we are informed, that sainfoin is allowed on all hands to be an admirable improvement on limestone rocks and chalk downs, which, in order to be cultivated to the greatest advantage, should be in this course, with no more arable than is necessary for the change. Thus, if sainfoin last sixteen years, as it certainly will if properly managed, then sixteen parts of the down should be sainfoin, and as many more parts as there are years necessary for tillage, before the ground should be sowed with it again: suppose this period to be five years, the portions would then be 16 sainfoin; 1 sainfoin pared and burnt, and under turnips; 1 barley or oats; 1 clover; 1 wheat; 1 turnips; 1 barley or oats, and with this crop sainfoin sown again=22. In another part we are informed that sainfoin is also a great improvement in thin, loose, dry, sandy loams, upon marl or chalk bottoms.

Thin soils that wear out, or tire of clover, are laid down to great advantage with it, will last twenty years, and pay the farmer as well as his best corn crops. If a flock of sheep be an object of primary importance, this plant will afford them plenty of dry food for winter, in hard weather. An acre of indifferent land will yield two tons of sainfoin dry, and therefore twenty acres will serve 1000 sheep for a month, supposing a sheep eats three pounds of hay in a day, which is a large allowance. * * * *

It flowers about the middle and towards the end of June. The seeds are large, and when sown in wet soils generally burst and rot without vegetating. There is some difference of opinion with respect to the best season for sowing; according to several trials that I have made, the middle or end of April is the most certain; but when sown in the autumn, unless the soil be favourable, many of the plants are lost during the winter: should circumstances prove otherwise, the autumn sowing will be found the most advantageous, as it affords nearly a full crop in the ensuing season. * * * *

The grasses, and other plants, best fitted for alternation, as green crops with grain, are such as arrive at perfection in the shortest space of time, or within the compass of two years; such as have their leaves broad and succulent, and that do not quickly run to seed. Plants of this description are supposed to produce the greatest weight of herbage at the least expense to the soil.

It is a curious and well-known fact, that any species of plant that has continued till its natural decay on a particular soil, cannot be again immediately reared with equal success on the same spot, till some other crop intervene; but that a *different* species of vegetable will there succeed better, for its peculiar period of life, than it would on a soil naturally better adapted to its growth, where it had just attained to perfect maturity. This holds good with respect to annual plants as well as to those that continue to live many years. But it is better seen in the former, as their habits and duration in the soil are oftener and more directly within the reach of common observation.

On this antipathy of plants seems to depend the theory of alternate cropping with green crops and grain—varying in some measure according to the circumstances of soil and climate; but the principle appears to remain the same.

On analysing a soil immediately before and after producing an impoverish-

Mangel Wurtzel—Carrots—Potatoes—their values.

ing crop, the results of such analysis do not point out any diminution in the weight or proportions of its constituents sufficient to account for the weight of vegetable matter produced. The decomposing animal and vegetable matters of the soil are the only constituents wherein a sensible loss is perceived.

M. Braconnot grew plants in substances free from any kind of soil, as in flowers of sulphur, and in metal. He supplied the plants with distilled water only. They arrived, by these means, to a perfect state of maturity. The produce was submitted to careful analysis; and the results showed that the different vegetables so produced, contained all the constituents of the different species, precisely the same as when the plants were cultivated on their natural soils. * * * * *

	Green Food.	Nutritive Matter.
	lbs.	lbs.
Mangel wurtzel, or white beet, (<i>Beta cicla</i>), produces upon a suitable soil, or a deep rich loam, on an average, twenty-five tons* of green food per acre, every pound weight of which contains 390 grains of nutritive matter; and therefore per acre	56000	3120
Carrots (<i>Daucus carota</i>), produce upon a deep light loam, on an average, eleven tons, every pound of which contains 750 grains of nutritive matter	24640	2640
Potatoes (<i>Solanum tuberosum</i>), produce upon a fresh loam, of intermediate quality as to moisture and dryness, on an average, 15 tons per acre, affording of nutritive matter per pound, 1000 grains	33600	4800
The common field or white turnip (<i>Brassica rapa</i> , var.) affords from a sandy loam, upon an average, per acre, 16 tons of green food, a pound of which contains 320 grains of nutritive matter	35340	1638
The Swedish turnip, or ruta бага (<i>Brassica, rapa</i> , var.), produces on a favourable soil, or a strong loam, on an average, 13 tons per acre, a pound weight of which affords of nutritive matter 440 grains	29120	1830
Cabbages (<i>Brassica oleracea</i> , var.), which delight in a rich strong loam, afford of green food, on an average per acre, 25 tons, every pound of which contains 430 grains of nutritive matter	56000	3440
Kohl rabi (<i>Brassica oleracea</i> , var.), the produce from a soil similar to that for cabbages or Swedish turnips, is on an average 14 tons per acre, and affords of nutritive matter per pound 420 grains	31360	1881

If a plant, therefore, impoverishes the soil in proportion to the weight of vegetable substance it produces on a given space of ground, the following will be the order in which the plants just mentioned exhaust the land.

Mangel wurtzel	25	The proportions which they bear to each other with respect to weight of produce.
Cabbages	25	
White Turnip	16	
Potatoes	15	
Kohl rabi	14	
Swedish Turnip	13	
Carrots	11	* * * * *

* I have found this variety less nutritious and less hardy than the pink or light red mangel wurtzel. Seventy-eight thousand four hundred and forty-eight pounds of the pink kind were produced, in 1823, upon one acre and fourteen perches of farm land in Philadelphia County.—*Am. Ed.*

*On Mangel Wurtzel—Its cultivation, product, and value
on Dairy and Breeding Farms—Causes of failure—
Quality of Butter—Application of Cultivators—Ad-
vantages of a flat surface in this climate—Superiority
of Indian Corn for the general purposes of American
Farms.*

By JOHN HARE POWEL, Esq.

Powelton, Philadelphia County.

I enclose certificates, showing that sixteen hundred and thirty-four bushels of mangel wurtzel, weighing seventy-eight thousand four hundred and forty-eight pounds, were produced at Powelton, upon one acre and fourteen perches of farm land, accurately measured by a regular surveyor.

I selected a parallelogram, containing thirteen contiguous rows, which were drawn and measured in my presence, to ascertain the largest quantity, which had grown upon the richest part of the field. One hundred and forty-three baskets, equal to one hundred and seventy-four bushels, were produced upon thirteen and an half perches, at the rate of two thousand and sixty-five bushels per acre, weighing 44 tons, 5 cwt. 27 lbs.

I am satisfied that the account of my farmer is correct, and as the roots had been drawn ten days, had been closely cut beneath the crowns, were dry, and entirely free from dirt, both the measurement by the basket, and the estimate by weight, must be fair. If a barrel had been used, or any other large vessel, of *similar shape*, the crop would appear greater, as the measure would not have been so often filled, and consequently not so often heaped.

Mr. Milnor, the Recording Secretary, was good enough to superintend the measurement of the basket, and saw the manner in which it was filled.

I submit to you the shingles containing the original scores, and refer you to him for corroboration of the facts. It may be well to state, that however great this crop may appear, in England a larger product has been obtained.

My soil was not naturally strong; it has been gradually so much deepened, as to enable Wood's plough, No. 2, drawn by four oxen, to plough fourteen inches deep. Fresh barn-yard manure was equally spread upon the surface, and ploughed under in the early part of April, in quantities not larger than are generally used for potato crops in this country. Early in May the land was twice stirred with Beatson's scarifier—harrowed—rolled—after stirred—harrowed, and rolled again in the opposite direction. The holes for the

seeds were made by a wheel containing pegs in its circumference, which penetrated the ground about an inch, leaving intervals of four inches; the rows were made two feet asunder; two capsules were dropped into each hole; the wheel of a common barrow was passed over them, thus compressing the earth, and leaving a slight rut, for the retention of moisture.

A small cultivator, which I had contrived for the purpose, was drawn between the rows soon after the weeds appeared; a three-inch triangular hoe removed the alternate plants, leaving the others at distances, varying from 8 to 12 inches asunder. The cultivator was twice used before the 20th of July. The heavy rains of August made another hoeing necessary, and surcharged the ground so much with moisture, that all roots increased much less in that month, than during the same time, in the two last years.

In order to convey an idea of a mangel wurtzel crop, to some of the members who are not acquainted with its usual product, it may not be improper to state, that three-fourths of the root extend above the ground—that I last year obtained one, which at Mr. Landreth's shop weighed, some days after it was drawn, 17 lbs. 10 oz.

I this year desired smaller roots, which might grow so closely, as by their leaves to protect the soil as much as possible from the exhalations of the sun. My cultivator, by its peculiar form, enabled me to cut off the weeds when the plants were so young, that if I had applied the plough, their crowns must have been covered in many instances by earth, occasionally falling from its land side. The failure which attends the cultivation of most root crops in drills, proceeds from the neglect of weeds in their early stages. Four or five days of delay, frequently make the difference of fifteen days in the labour of making clean an acre of ground. The same weeds which a boy with a sharp shingle could remove at the commencement of one week, may, before the end of the next, require the application of an implement drawn by an horse.

I ascribe my success, in great measure, to the use of *Wood's extraordinary plough*, which enters the soil more deeply, and pulverizes it more perfectly than any other I have ever seen with equal force in any country—to the use of cultivators, which complete the production of fine tilth—to the destruction of the weeds on their first appearance—to leaving the smallest space upon which a horse can walk between the rows, and above all to *planting the seeds of a proper kind upon a surface which is kept perfectly flat.*

In proof of the advantages of this invaluable root, I exhibit

Root Crops cannot supplant Indian Corn.

cream obtained from one of my cows, which has been fed for several weeks, exclusively upon mangel wurtzel and millet fodder. You will find that its colour and flavour are perfectly good; the butter which it affords, is more like that produced in June, than any I have used, excepting such as had been derived from cows fed on carrots and corn meal.

Notwithstanding the large product, I am confirmed in the opinions, which I have repeatedly expressed, that in this country, nothing can supplant the king of vegetables, Indian Corn. I would recommend mangel wurtzel, in preference to all other roots, for dairy and breeding farms: and to a limited extent, where labour and manure are not too dear, in comparison with the value of land, it should be cultivated upon all farms.

The expense of preparation for a mangel wurtzel crop is not so great as might be supposed.

The labour of four oxen, a ploughman and driver in ploughing one acre, fourteen inches deep, costs	\$3.00
Three stirrings with Beatson's <i>improved</i> scarifier, which two oxen managed by one man, can readily pass over five acres in good condition, in one day,	1.25
Two harrowings and two rollings,	1.25
Dibbling with a wheel,	1.00
Dropping seeds, (if performed by men,)	5.00
Pressing them under by a wheel,	1.00
Hoeing and thinning,	15.00
Cleaning with Blockley cultivator, drawn by one horse,	3.00

\$30.50

I am, very obediently, yours,

JOHN HARE POWELL.

To the President of the Pennsylvania Agricultural Society.

Philadelphia County.

At a meeting of the Pennsylvania Agricultural Society, held in November, Mr. Powell exhibited a bottle of cream, produced by a cow, which he stated, had been fed solely on mangel wurtzel roots, and millet hay. It was pronounced by all who examined it, to be equal, in richness and flavour, to any they had ever seen.

His Durham Short-horn heifers, fed upon these roots, yield very large quantities of milk, affording the *richest* cream I have tasted.

JOHN P. MILNOR,

Recording Sec'y. Penn. Ag. Soc.

We have counted the scores, examined William Powell the farmer, and are satisfied, that the piece of land at Powelton, measured by Mr. Henry Serrill, produced thirteen hundred and forty-one baskets of mangel wurtzel, and that the part thereof containing thirteen and an half perches, produced one hundred and forty-three baskets, all the roots having been closely cut below the crowns.

JOHN P. MILNOR,
HENRY SERRILL.

Mangel Wurtzel—Product—Certificates—Oaths.

November 19.

I have carefully measured the basket used by William Powell, and referred to in the foregoing certificate, and find, that it contains precisely one bushel and seven quarts. A basket of this size, wide at top, and of sufficient height, was selected, in order that the beets might be fairly measured, by being placed singly, nearly *perpendicularly*, their necks extending above the sides, upon which others were afterwards laid horizontally until the usual heaped measure was given; thus leaving as few interstices as possible.

JOHN P. MILNOR.

Having measured the above piece of ground, I certify it contains one acre and fourteen square perches. A part of which, containing thirteen and an half square perches, had been staked out in order to ascertain the exact quantity of mangel wurtzel thereon.

HENRY SERRILL,
Surveyor.

I have measured the mangel wurtzel, taken from farm land at Powelton, surveyed by Mr. Serrill, and am convinced from the careful manner in which I scored upon shingles with a knife every basket as it passed, from my hand, and as I was checked in my account by the person who assisted me, it is not possible any mistake could arise. Upon one acre and fourteen square perches, thirteen hundred and forty-one baskets were produced. From the piece which had been staked out, in order to ascertain the exact quantity of mangel wurtzel thereon, I took one hundred and forty-three baskets. The strip included thirteen adjoining rows, which were measured from the edge towards the centre of the field without any break.

WILLIAM POWELL,
Farmer at Powelton.

Philadelphia County, ss.

Personally appeared before me, the subscriber, one of the justices of the peace, in and for the county aforesaid, the above named William Powell, who being sworn, according to law, saith, that the foregoing statement is true, to the best of his knowledge and belief.

Sworn and subscribed, this twenty-eighth day of November, A. D. 1823.

GEORGE HOWARTH,
Justice of the Peace.

West Philadelphia.

A farm basket, properly filled with mangel wurtzel, was brought to my store, by Mr. Powell's farmer. The roots alone, weighed rather more than fifty-eight and an half pounds.

DAVID HOOPES.

The Committee appointed to examine the papers relative to a crop of mangel wurtzel raised last season by John Hare Powell, Esq., after inspecting the certificates, are unanimously of opinion, that Mr. Powell at Powelton raised on one acre and fourteen perches of ground, thirteen hundred and forty-one baskets, equal to sixteen hundred and thirty-one bushels of mangel wurtzel, weighing seventy-eight thousand four hundred and forty-eight pounds; and that he is justly entitled to a premium therefor from the Pennsylvania Agricultural Society.

GEORGE W. HOLSTEIN,
ELIJAH LEWIS,
MANUEL EYRE.

April 24th, 1824.

Premium relinquished.

Extract from the minutes of the Pennsylvania Agricultural Society.

JOHN P. MILNOR,
Recording Secretary.





Manures—Lime—Deep Ploughing.

On Deep Ploughing—Oyster-shell Lime—the management and application of Vegetable and Animal Manures.

BY JOHN HARE POWEL, ESQ.

Powelton.

I have reclaimed, by oyster-shell lime and deep ploughing, a farm, made sterile by a series of the most exhausting crops, which the cupidity or folly of bad tenants could suggest. I am not ignorant of the objections which have been often brought, and not less ingeniously supported, against breaking the “pan,” and reversing the sub-soil; but I have seen few instances, where *ultimate* success has not attended deep ploughing, in a *judicious course* of management, except on arid sands. I have turned up sub-soils, of different hues, mixed with substances, varying, from tenacious clay, to loose gravel, or sparkling sand, and have found, that those who condemned my “burying fertile mould beneath sterile clay,” confess, that at the end of five years, I obtain great crops, by means of deep and fine tilth, from a chesnut ridge, and gravel bottom, originally covered with *barren oak* and cedar trees. Some of my friends, who are in the habit of hauling manure to the distance of twelve miles, may imagine, that my proximity to the town, affords a remedy for all the defects of soil. Within twelve years, I have expended but six hundred dollars in the purchase of manure, although during part of the time, large quantities of hay were sold from my farm. Where the mould was five inches deep, I ploughed ten in the autumn—applied caustic oyster-shell lime, in quantities, equal to eighty or an hundred bushels per acre. In the spring, I ploughed six, reversed the sub-soil, and took a white crop. In the next autumn, I ploughed nearly eight for a winter crop—in the succeeding year, the original depth of ten inches was reached by the plough. In some instances, for root crops, it has been gradually increased. This day with Wood’s Plough, No. 2, drawn by four oxen, my land has been ploughed for mangel wurtzel more than fourteen inches deep. The “caput mortuum” or sub-soil, after having in the first instance been corrected by the causticity of lime, and the expansion of frost—improved by the atmosphere, and the calcareous matter which remained, was turned below the depth of an ordinary furrow. The first crop

Manures—Animal—Season and Mode of Application.

was certainly better than that which had preceded it, as the advantages derived from the lime, the larger supply of moisture, secured by the greater capacity of the loose soil for its deposit, and the increased depth of tilth, more than compensated for the injury, that might be apprehended, from the admixture of small portions of "sour soil." The next crop was nearly as good—the succeeding crops have gradually increased in quantity, weight, and value. The ingenious inventor of the sub-stratum plough, has added much to our means of improvement, in this, as he has done by the application of his skill to the production of various implements, valuable by their simplicity and cheapness—but whilst I acknowledge the benefit he has conferred, by placing a substitute for deep ploughing within the reach of those, who cannot be tempted to reverse the sub-soil, I cannot avoid thinking, that if the sub-soil in all cases be deleterious to vegetation when brought to the surface—when meliorated by the chemical action of lime—by the expansion of frost—by exposure to the influences of heat and light—by the operation of various agents and manures, employed for the mechanical separation of its particles, or the supply of its deficiencies, it must in most cases, be injurious to the tender radicals, which have been led to a "caput mortuum;" whither they never could have been seduced, but by the attractions of water, to vegetate, for a time—soon after to die, and disease or debilitate the plant.

I have never had apprehension of the loss of animal manure by sinking, as its component parts are generally so insoluble in water, as to cause them to be left by filtration sufficiently near to the surface for all our purposes: but I have had many motives to guard against its escape by evaporation, and therefore invariably deposite it deeply, and generally in its freshest state, beneath the surface of the land. My experience during nearly twenty years has taught me that in *this climate*, where the exhalations of the sun during one season, the influence of wind—the effects of melting snow, and torrents of rain, during another, upon a surface made impervious by frost almost to the edge of an axe, top dressing, except when principally composed of calcareous matter, should seldom be applied. Old pastures remarkable for the excellence of their herbage, or grass lands within the reach of large towns, may be profitably enriched by the application of animal manure to the surface in the spring, when the soil is open, and the grass by pushing forth its leaves, soon affords some protection, from the sun, whilst they imbibe to a certain extent, the fertilizing principle, passing off in a gaseous form.

The expedients which the *dearness* of land, and the *cheap-*

Stercoraries—"Compost Pies"—Foreign Practices.

ness of labour, have coerced certain Europeans to adopt, cannot for ages become profitable, where the farmer tills generally his own soil; and the labourer is paid, and protected, as being worthy of regard, and the wages of his toil. Compost heaps, in certain situations, may be advantageously formed. In very few would they repay the cost of chopping, turning, and scientific commixing, without noticing the loss, in this climate, at each operation, of animal matter, by the escape of its volatile parts—not the least essential of which it is formed. I am satisfied, that all animal manures should, if practicable, be applied in their freshest state—that where this cannot be done, they should be covered with earth, and exposed in the fold yard, to the treading of beasts, in order, that the mass may be made compact—the air be excluded—and consequently, decomposition retarded, until its influence shall be directly applied, to stimulate plants, and enrich the soil.

The curious sheds, ingenious stercoraries, and mellow compost "pies," of which prints are given, and on which long essays have been written, I have been convinced, are adapted neither to the climate of Pennsylvania nor to our purses nor plans.

I should be unwilling to shake off some of the prejudices, which we have imbibed, with our mother tongue: but although I do not object to cut a heavy cloth coat, in an August day, after a foreign winter fashion, I am not prepared to remain a colonist in thinking, that we cannot manage our farms, without European precedent or rule.

If any man were to cultivate a large farm in this state, after the most approved scientific mode, which the agricultural Doctors would have us adopt, he might expect to have an empty barn, and ere long a light pocket.

Science is essential to the agricultural art—chemistry aids it at every turn,—cooking is a chemical process; yet I should be unwilling to be fed, with soup from the laboratory of the great Davy himself, unless he had been *practised* in seasoning his broth—even if with the aid of the whole college of physicians, it were scientifically compounded, as Smollett's feast of the ancients, and served in classic vases of gold.

I am, very obediently, yours, &c.

JOHN HARE POWELL.

To the President of the Pennsylvania Agricultural Society.

Hay—Making and Securing.

On making Hay—Hay Houses—Pennsylvania Barns—Arrangements of the Fold Yard.

BY JOHN HARE POWEL, Esq.

Pöwelton, July 1, 1824.

SIR,—Your profitable management, much more than the high state of cultivation, in which the officers of the society found your farm, leads me to desire a statement of the system you pursue, in the preparation of your soil—the arrangement of your fields—the rotation of your crops—the mode of securing fodder—feeding cattle—and the application of their manure. I was struck by the appearance of your stock, and gratified at finding that our opinions and practice coincide, in the preparation of hay, and distribution of it in hay houses, instead of huge *moirs*.

I have thought the parade of Pennsylvania barns not more profitable than the decoration of our fine blue waggons, or the musical bells attached to our teams. The ingenious mode adopted to deprive grasses of their most valuable and nutritious parts, is so absurd, that it long since would have been abandoned, I should hope, had not our prejudices in favour of old usages, which generally keep practical farmers right, in this instance put us all wrong.

In good weather, most crops of grasses can in this state be secured without being *shaken* from the swarth. My uniform practice for many years has been to allow grass to remain nearly two days untouched, to gather it by an horse rake, cock it in *the hot part* of the day, salt it, and place it in an hay house, which admits a free circulation of air. My clover, like yours, retains much of the colour of its blossoms and leaves. The advantage of pitching hay from the carriage, into “a bank barn,” does not counterbalance the expense of labour in preparing, the loss of nutrition in drying, and the great danger of fire from heating, as well as from the escape of moisture, which so often in *this* climate attracts lightning, to the utter destruction of the building, and all the hopes of the farm.

The convenience of feeding, has also been brought to aid the arguments, in favour of a great Pennsylvania barn. We owe much of our success to the industry, care, and skill, of our excellent German population, but I think it may be questioned, whether the expense they incur, in the arrangement of their farm buildings, is not very often mischievous, not merely useless, in making tender their cattle, and diseasing

Hay Houses—Cattle Sheds, &c.

them by bad hay. It is scarcely possible in this state, where the changes of climate are sudden and severe, to guard farm stock from suffering, when they are made warm throughout the night, and are necessarily exposed to pelting storms during part of the day. I am convinced, that milch cows, and very young calves, require protection from cold—all other cattle, if guarded from wet, and currents of wind, feed with more appetite, digest with more ease, work with more vigour, and encounter accidental exposure, with less danger of harm, than if they be confined within thick stone walls, inhaling an impure atmosphere, from which by the instinct of nature, if not thwarted by the ill-judged contrivance of man, they would fly.

I would suggest, that the position for the farm yard be selected, as usual, at the foot of a small hill, of which the southern side, should be cut in such manner, as to admit the erection of a barn sufficiently large for all its usual purposes, except that of holding hay, and feeding cattle. Roofs pitching to the south, and sufficiently capacious to protect all the hay, straw, fodder, and stock of the farm, should be extended at both gable ends. For the support of the fodder lofts, and roofs, pillars of brick, or stone, should be erected at proper intervals; for the security of the bank, and the road at its edge, a wall somewhat higher than it, should be built—a space of two feet should be left, between the northern side of the loft and the wall. Racks should be placed perpendicularly, with their outer edges exactly corresponding, and parallel with the wall, and side of the loft. Thus a space of two feet would remain between them and the wall, to be filled with hay. A long shutter, sufficiently wide, may be secured by hinges, attached to posts, on the outer side of the wall, in order that when the rack shall have been filled, by pitching from above, it may be closed at a proper angle, to exclude rain or cold air.

Stalls for cattle, pens for sheep and calves, should be at fit distances placed beneath the hay—palings, and gates, might secure them on the southern, or outer side. The hay being exposed on two of its sides, would require infinitely less drying, than if pressed closely, in a great mass, within the thick walls of a barn. It is scarcely to be believed, by those who have not seen the experiment, how little drying grass requires, when it is to be salted, and thrown lightly into an open hay house. By beginning at one end of a long loft, and discharging the loads, so as to not more than half fill it, until the hay be extended to the other, by the time that the end at which the farmer began, shall be quite filled, his hay, in de-

Root Crops—White Turnips.

spite of the state in which it had been hauled, will be sufficiently dry.

The advantages I propose, are the saving of labour in making the hay, of money in building the barn, of nutrition from not exhausting the grass by unnecessary exposure, to the rays of the sun; and to *practical* farmers, what to them is of consequence, a return in profit, on cattle, which after being fed from January to July upon hay, and grass alone, may be exposed on Philadelphia shambles with credit to the feeder, as yours have been shown.

I am yours, &c.

JOHN HARE POWEL.

To John G. Watmough, Esq.

On Root Crops—Growing—Securing—Their application and value.

BY JAMES WILLIAMS, Esq.

Philadelphia County.

My present observations will be chiefly confined to the culture and use of the common field turnip, the value of which, I apprehend, is not sufficiently appreciated in this country. I have frequently been told by farmers, that unless near market, they are scarcely worth raising, and as to fattening cattle with them, that was a thing utterly impracticable. Having seen that in England fat beef is made from turnips, with very little other food, and believing there was the same nutrition in them here as there, I resolved to satisfy myself. I, therefore, about the beginning of January last, purchased and stalled a pair of young oxen, or rather what the drovers would term coarse, poor, rough stags. They cost me \$25. You may judge, by the price, they were no great things, as fair store cattle of the same weight were selling at the same time and place, for 17 to 18 dollars per head. I had two bushels of turnips chopped up morning and evening, and three quarts of ground oats and corn meal, or buckwheat meal, mixed with each mess, which I divided between them. In the middle of the day and at night they had alternately, oat straw, and corn fodder. In three months and an half they were good beef, but I kept them another month for a better market, and the latter end of April turned them out to pasture with the cows, still feeding them night and morning, but more sparingly. On the 25th of May, I sold them for \$70.20, which was six dollars per hundred. A steer fattened by Mr. John Ridsen, at Hopkin's ferry, near Holmesburg, was slaughtered at the same time, and was put up about the same time that mine were. His was fattened on

White Turnips—Nutritive Properties.

2 quarts of Indian meal, about $\frac{1}{2}$ bushel potatoes, and as much good clover hay as he could eat per day. There was very little difference in the quality of the meat; indeed I believe they would have commanded the same price at the shambles—and look at the difference of feed. The quarters weighed as follows:

One Stag	605 lbs.—gut fat, 65 lbs.
One do.	565 — do. 60
Mr. Ridsen's Steer, . .	650 — do. 75*

* We shall at all times be glad to receive the communications of this intelligent and zealous cultivator, and we trust he will pardon our exhibiting, in a condensed view, the result of his very *satisfactory* experiment.

He states that "about the beginning of January, he purchased and stalled a pair of young oxen, which cost twenty-five dollars." "Two bushels of turnips chopped up morning and evening, and three quarts of ground oats and corn meal, or buckwheat meal, mixed with each mess," were "divided between them—in the middle of the day and at night, they had alternately, oat straw and corn fodder." In the "latter end of April they were turned out to pasture," "still feeding them night and morning, but more sparingly." "On the twenty-fifth of May," he "sold them for \$70.20."

From the 5th of January to the 25th of May is 140 days. They consumed daily, that is morning and evening, 6 quarts of ground oats and corn meal, or buckwheat meal, = 840 quarts or $26\frac{1}{4}$ bushels at 50 cents \$13 12

They ate oat straw or corn fodder, which within five miles of Philadelphia, was worth, it is presumed, at least 15 cents per cwt., or \$3 per ton. Allowing each ox to consume or waste 2 cwt. per week, the two oxen consumed or wasted, in 140 days, or 20 weeks, 4 tons at \$3 per ton 12 00

Original cost of Oxen	25 00
	<hr/>
	\$50 12
Price obtained for the Oxen when fatted	70 20
	<hr/>
	20 08

They ate 2 bushels of turnips chopped up morning and evening, that is, 4 bushels per day, during 140 days = to 560 bushels, which at 3 cents 4-7ths per bushel would amount to 20 08

Thus if our calculation be correct, it is established, that white turnips, when chopped and manufactured into menses, are worth three cents and four-sevenths of a cent per bushel. How much the labour of preparation is worth, we venture not to decide, but suppose it to equal at least the value of the manure.

To determine the comparative values or nutritive properties of vegetables, a series of experiments are necessary. They must be made upon various animals of the same breed—of similar ages—reared, fed, housed, managed, and even watered under similar circumstances.—EDITOR.

White Turnips—Nutritive Properties.

This establishes the fact, I think, that there is some virtue in a white turnip, although a celebrated writer, in eulogizing his favourite plant, the ruta бага, contemns it as the "poorest of all roots of the bulb kind, cultivated in the fields." Again, he says, "hogs are the most able tasters in all creation; they will eat nothing that is poor in its nature; a white turnip they will not touch unless they be on the point of starving."

My hogs, however, were not such epicures; I have abundance of proof, that I kept 13 hogs and pigs, last winter, almost entirely on white turnips; they had no other food besides a bucket full, containing less than a half bushel of rye shorts to a hogshead of water, and the sour milk from three tolerable cows. They were always ready for the turnip, and kept in excellent condition. The *fat hogs* fed on corn for five weeks before they were killed, ate them with avidity, until the day before they were slaughtered. I sometimes chopped up carrots, beets, and turnips together, to see if a preference was given. The larger swine ate indiscriminately; the smaller ate the turnips first, perhaps because they were more easily masticated. My milch cows had from $\frac{1}{2}$ to $\frac{3}{4}$ bushels per day each, with three or four handfuls of meal, which kept up a flush of milk, and I have at no time had sweeter butter. Now, after what I have stated, you will readily conceive it would be as difficult for the aforesaid writer to convince me, that the white turnip is so very poor a thing as he represents, as it was for him to persuade the generous inhabitants of the Emerald Isle, that nine-tenths of the Irish potato is composed of "earth, straw and water." Yet this same writer admits, alluding to the devastation of the turnip-fly in England—"that if any man could find out a real remedy, and could communicate the means of cure, while he kept the means a secret he would be a much richer man than he who should discover the longitude, for about *fifty thousand* farmers would very cheerfully pay him *ten guineas a year each*."*

What would Great Britain do with her numerous flocks, and herds, without her turnip crop; and this subject, I sincerely believe, is daily becoming of more importance to the people of this country, and to the state of Pennsylvania in particular. Our population is constantly and rapidly increasing; manufactures are increasing in the same or greater proportion, and wool-growers will multiply in the same ratio. Sheep, of which it is computed there are already about 2,000,000 in this state, are now decidedly the most profitable stock farmers can keep. Wool is *now* brought all the way from the state of Ohio to the Philadelphia market. Let the

* The Fly attacks Ruta бага as well as White turnips.—EDITOR.

White Turnips—Mode of Cultivation.

sheep proprietors, then, if they wish to keep their flocks on cheap, succulent and wholesome food, during the winter months, look to the turnips, although the climate of this country may not be so congenial to the growth of this esculent as that of England. I have never found much difficulty in raising a crop, even in unfavourable seasons. The plan that I adopt and recommend is this: if, for instance, I wish to sow three or four acres, I begin early in the season, and pare half an acre or more, according to the state and appearance of the weather; as soon as the ground is well ploughed and harrowed, I immediately sow whilst fermentation is at work; this is of more importance than many people imagine. Always sow and plant on fresh ground, if possible. I then run a roller over, if the ground is not too wet, to press the seed to the earth, which I also consider of consequence, as vegetation will more speedily ensue. I would also advise that a harrow should be run over the seed before the roller, as it may give the plant two chances against its most formidable enemy, the fly. I fancy it has been pretty clearly ascertained that this seed will bear a deep covering. I generally sow about $1\frac{1}{2}$ lbs. per acre. In two or three days, or as soon as convenient, and the weather permits, I prepare another half acre or more, and so on to the end. If, perchance, any particular sowing should have been cut off by the fly, or from drought or some other unforeseen cause did not succeed, I stir well the ground afresh and sow again. After the ground is prepared, the labour necessary to bestow on a turnip crop, compared with its value, is not worth mentioning. Sowing, pulling, topping and housing comprises the whole. I last year sowed some purple top amongst four acres of corn, broadcast; I presume I had two hundred bushels to the acre; what I sold in market I got $18\frac{1}{2}$ to 25 cents for. But supposing them to have been worth 10 cents for farm use, my turnips were of more value than my corn of 40 bushels to the acre, at the price of that article last year. Some of the turnips weighed 4 lbs., and cultivated and harvested at less than one-fourth the expense of corn. If allowed to arrive at maturity, two men and two boys will pull, top and secure from the frost even in the field, put in heaps of 40 or 50 bushels each, and covered with earth, from 80 to 100 bushels, or more, according to their size; and still more, if thrown into vaults or cellars, in the course of a day.

The objections made by many, that turnips are not worth attending to in an Indian corn country, because they are a precarious crop, appears to me to be an unfounded prejudice. Corn, doubtless, is an excellent crop, and where justice is done to it, entitled to all those eminent qualities emphatically

Successful Experiments with Rape or Cole.

ascribed to it, of "meal, meadow and manure." But corn, as well as the turnips, has its enemies, and requires constant attention, from the time it is planted until the ears begin to appear. I have shown to the best of my judgment and that of others, that where land is capable of producing 40 bushels of corn to the acre, that the vacant spaces between have yielded 200 bushels of turnips in a favourable season. But supposing the turnips fail entirely, which is not probable, if the method I suggest be adopted, what is there lost in this case but a little labour and a little seed; a consideration, I should hope, too insignificant to deter any husbandman, who studies his interest, from hazarding the experiment.

I am, dear Sir,

Your most obedient servant,

JAMES WILLIAMS.

JOHN HARE POWEL, Esq.

Corres. Sec'y of the Penn. Agricul. Society.

*On Rape—Its cultivation and produce in Seed—
Its value as Green Food for Neat Cattle and
Sheep.*

BY JOHN HARE POWEL, Esq.

Powelton, Philadelphia County, 1827.

DEAR SIR,—In accordance with your request, I have prepared a notice on the cultivation, uses, and value of cole or rape.

I am not aware that rape had been cultivated extensively in any part of the United States, until 1824, when Mr. Miller and Mr. Phillips of this county, obtained crops so extraordinary in product and value, as to induce them to recommend it to the notice of their neighbours, by the only sort of evidence, which operative farmers will receive.

I have no knowledge of its cultivation, except from my observations abroad. It is highly valued in many parts of Europe, as well for its product in seeds, as for the large quantity of green food

which it affords throughout the greater part of the year.

It may be sown either broadcast, or as turnips, in drills—or, in beds, and be transplanted as other varieties of the Brassica or cabbage genus. The usual and most successful mode, is to sow from two to three quarts of seeds broadcast in June or July, when intended for green food, but in August or September, when destined to produce seeds in the next year.

The process of transplanting is too expensive in this country—the necessary hand-hoeing, unless the land has been well prepared by previous cleansing crops, would make rape, in the broadcast system, much more troublesome, than if cultivated in rows, admitting the introduction of a horse-hoe. In favourable seasons I should not hesitate, where land is cheap and labour is dear, to allow it, when intended for green food, to take its chance, without the aid of either hand or horse-hoeing.

It produces in ordinary seasons on rich alluvial, or other deep friable soils, from forty to seventy bushels of seeds, determined in quantity, very much, by the accuracy of tillage and the condition and nature of the land. Great care and precision are necessary in harvesting the seeds in June or July, of the year succeeding that in which they are sown. When the pods assume a brownish cast, and some of the seeds become black, the crop is reaped with sickles—laid regularly in handfuls or *grips* in rows, where it continues until the straw becomes somewhat white—the seeds of the colour of which we find them in the shops. If they be allowed to become too dry, they fall out on the slightest mo-

tion—when carried too green, they are liable to be heated. At the proper time they must be thrashed in the field upon old sails or cloths, to which the crop should be carried upon sledges prepared with cloths, or by similar means. The seeds must be carefully spread in small quantities in granaries or on barn floors, and be occasionally moved.

Sheep and neat cattle are extravagantly fond of it—but of all plants, perhaps it is the most likely to cause them to be *blown*.

There is much difference of opinion as to its nutritive properties in the green state. I believe, that it quite equals the common cabbage, and very far exceeds turnips of all kinds in the quantity of nutrition it contains—in the value of the oil for various manufacturing purposes, and the excellence of the cake, after it has been expressed, for cattle food and the manure of drill crops, no question can be entertained.

It is not a certain crop—as it is exposed to all the enemies which attack turnips and cabbages—and is liable to be injured at the season of blossoming by mildew and sometimes by frost.*

* This excellent plant and mangel wurtzel, were as early as the year 1788, brought into the view of our farmers, by the original Philadelphia Society, which having two years before recommended clover and gypsum, continued its career of exertion and usefulness, until the year 1793, when the President, and with him that Society, died.

Extract from the Report of a Committee appointed by the present Philadelphia Society in 1826, to inquire into the proceedings of the Old Philadelphia Society.

“The Committee beg leave further to report, that of all the members who composed the old Philadelphia Society, none of the officers of the present Philadelphia Society” * * * * *

“But it does appear that Mr. Bordley, Mr. Powel and Mr. Clymer, were the most active officers of the association—that Mr. Powel as President attended every meeting but five from the organization of the Society in 1785, until March 1793—that in the summer of 1793, he having died, no other meeting of the Society was ever held.”

Philadelphia County, February 1, 1827.

TO JONATHAN ROBERTS, Esq.

President of the Pennsylvania Agricultural Society.

DEAR SIR,

By the frequent discussions which have appeared on particular breeds of cattle, among gentlemen whose liberal efforts must vindicate them from all suspicion of deception, I apprehend that some mistake has arisen from their estimates having been formed on specimens of the respective breeds, varying so much in character and properties, as to make it essential that they be classed as VARIETIES of a race, or even as individuals of distinct breeds.

I am the more confirmed in this impression, as some of these gentlemen are separated by hundreds of miles, and it is probable that many of them who have been most prominent in these discussions, have never had an opportunity of inspecting those individuals which my inquiries, and the examination of very extensive correspondence with the most eminent English breeders, have led me to consider as fair examples of the breed which has been the subject of dispute.

Independent of the liberal intentions by which various persons are actuated in importing, and multiplying, European breeds of stock, the emulation excited by Cattle Shows, and the distinction conferred upon the subject, by eminent men in many parts of the United States, cannot fail to create a strong desire in the parties and their friends to establish the grounds which they have taken, involving the soundness of their opinions, however aloof from any other views than those which the most generous minds might entertain.

I am aware that this is a hacknied topic, not likely to afford interest to such as are not actively engaged in the employment to which it refers; but as I conceive a very large portion of our community, and certainly not the least useful, are practically occupied in pursuits with which it is intimately connected, I have taken some trouble to make myself acquainted with its bearings, and have toiled through a mass of evidence, which has convinced me not only of the entire justice of the following statements, but of the correctness of the pedigrees which I have given.

In the language of the discriminating Editor of the American Farmer:—"Every farmer who has animals worthy of being selected and reserved as propagators of their kind, should NAME them, and accu-

“rarely note their ages and pedigrees. Extracts from
“Stock Registers, thus furnished and recorded, would
“effectually constitute a ‘**HERD BOOK**’ of autho-
“rity for general reference, preventing impositions,
“giving greater value to the good, excluding the spu-
“rious, and serving effectually the fair purposes and
“laudable objects, of both venders and buyers.”

I am of opinion that the pedigrees of many of the animals which have been sent to America, at high prices, will, if critically examined, prove to be defective on either side. Yet where no concealment has been practised—where the deficient pedigree has been given—or where none, except upon one side is shown, no intention to deceive can be imputed, nor can censure be attached to the English breeder who sends to a foreign land, animals which he supposes quite good enough for its purposes, if he require not more than their value at home, and especially if he avow that he does not deem pedigree essential to establish the reputation of his breed.

With a view to make the pedigrees clear to American husbandmen, who are not generally accustomed to the subject, and who have no means of reference to the Herd Book, the origin of each animal has been traced on both sides to its source, and hence when animals

were in any degree allied, repetition was unavoidable. It is not necessary to observe, that no man is expected to read the pedigrees through, and if he did not, without the adoption of this mode, the desired information could not be had.

I am, dear Sir,

Very truly yours,

JOHN P. MILNOR,

Recording Secretary Penn. Ag. Soc.

THE PENNSYLVANIA AGRICULTURAL SOCIETY,
AT THEIR MEETING IN 1825, NOTICE PARTICULARLY THE IMPORTANCE OF IMPROVED BREEDS OF LIVE STOCK, AND UNEQUIVOCALLY DECLARE THE IMPROVED DURHAM SHORT-HORNS TO BE "THE RACE OF NEAT CATTLE WHICH EXPERIENCE HAS PROVED TO BE SUPERIOR TO ALL WHICH WE HAVE EVER SEEN."

JOHN P. MILNOR,

Recording Secretary.

*Extract from the Report of the Committee on Neat Cattle at the
Pennsylvania Show of 1824.*

Your committee do not attempt to designate the points, or characteristics of the various animals which have been submitted to their view, as the display of nearly an hundred and fifty neat cattle of extraordinary excellence precludes the possibility of their adhering, in the present instance, to the rule which had been observed on former occasions; but they cannot avoid expressing their great satisfaction at the decided improvement which has been made in the stock, by the introduction of Mr. Powel's "IMPROVED DURHAM SHORT-HORNS," WHOSE BLOOD CAN BE TRACED IN NEARLY ALL THE BREEDING ANIMALS, WHICH WERE DISTINGUISHED AS BEST FITTED FOR THE GENERAL PURPOSES OF THE COUNTRY, BY UNITING, WITH FINE FORMS, THE REQUISITES FOR THE *dairy* AND THE *stall*.

THOMAS SMITH,
THOMAS SERRILL,
MATHEW ROBERTS,
RICH. B. JONES,
C. CHURCHMAN,*

Committee for Neat Cattle.

* All extensive graziers or dairy farmers.

MARYLAND CATTLE SHOW.

June 1, 1825.

The Committee on Neat Cattle report, that they award to Col. Lloyd, for his bull Champion, the premium, "as the best full blood Improved Short-horn Bull. Champion having heretofore received a discretionary premium on his arrival in this country, his owner generously declined entering him for the premium to be awarded to the best bull of any breed—believing, we presume, with this committee, THAT TO BE THE BEST BULL OF THE IMPROVED SHORT-HORN BLOOD, IS TO BE THE BEST BULL OF ANY BREED." * * * * *

EDWARD N. HAMBLETON,
ROGER BROOKE,
WM. CARMICHAEL,
CHARLES K. DORSEY,
REUBEN M. DORSEY,
JOHN KELSO.

At the BRIGHTON and WORCESTER Shows, Short-horned cattle received the highest commendation and the largest rewards.

Opinion of a Committee of the Philadelphia Agricultural Society in favour of Short-Horns—Annual Meeting, 1827.

Mr. Powel having exhibited one of his imported heifers of the Improved Durham Short-horn breed, the committee added, "she possessed, in a high degree, all the fine points for which that valuable and beautiful breed of cattle is celebrated.—Notwithstanding she had been kept, thus far, through the winter without grain, she was in high condition; the best evidence that could be offered of her disposition to fatten on simple food."

AARON CLEMENT,
MICHAEL NEWBOLD,
WILLIAM PHILIPS,

Committee.

Mr. Powel adduced evidence of the dairy properties of certain families of the Improved Short-horned breed, among which were recent letters from Dr. Elmer, of New Jersey, and Mr. Carpenter, of Lancaster county.

AT FOUR CATTLE SHOWS HELD BY THE PENNSYLVANIA AND PHILADELPHIA AGRICULTURAL SOCIETIES, FIFTY-SIX ANIMALS OF SHORT-HORNED BREED, TOOK PREMIUMS EQUAL TO \$1160, although at one of the shows, the principal herd of Short-horns did not contend for a prize. It is believed that in no instance has any THOROUGH-BRED individual of the Improved Short-horned breed been beaten by any animal, of any other breed, at any show in the United States.

We are aware, that cattle with SHORT HORNS, but without the PEDIGREE, PROPERTIES, OR POINTS of the IMPROVED BREED, although sometimes purchased at great cost, have been condemned as unthrifty, and ill adapted for American farms—and we are also aware that some of those, which have been imported with DEFECTIVE pedigrees, have been excelled, but THEY should not be received as specimens of the IMPROVED breed.

From Bailey's Survey of Durham, made by order of the British Agricultural Board.

As a proof of the estimation in which this breed of Short-horned cattle is held, not only by skilful judges from distant parts of the empire, *but in its own immediate neighbourhood*, it is merely requisite to adduce the catalogue of Mr. Charles Colling's sale, which took place at Ketton, on the 11th of October, 1810, in consequence of his having declined business.

COWS.

Guineas.		Guineas.	
Cherry, 11 years old, . . .	83	Lily, 3 years old, . . .	410
Kate, 4 years old, . . .	35	Daisy, 6 years old, . . .	140
Peeress, 5 years old, . . .	170	Cora, 4 years old, . . .	70
Countess, 9 years old, . . .	400	Beauty, 4 years old, . . .	120
Celina, 5 years old, . . .	200	Red Rose, 4 years old, . . .	45
Johanna, 4 years old, . . .	130	Flora, 3 years old, . . .	70
Lady, 14 years old, . . .	206	Miss Peggy, 3 years old, . . .	60
Laura, 4 years old, . . .	210	Magdalen, 3 years old, . . .	170
Cathleen, 8 years old, . . .	150		

BULLS.

Comet, 6 years old, . . .	1000	Northumberland, 2 years old, . . .	60
Yarborough, 9 years old, . . .	55	Alfred, 1 year old, by Comet, . . .	110
Cupid. Not sold, . . .		Duke, 1 year old, by Comet, . . .	105
Major, 3 years old, . . .	200	Alexander, 1 year old, by Comet, . . .	60
Mayduke, 3 years old, . . .	145	Ossian, by Windsor, . . .	76
Petrarch, 2 years old, . . .	365	Harold, by Windsor, . . .	50

BULL CALVES.

<i>Keiton</i> , by Comet,	50	<i>Narcissus</i> ,	15
<i>Young Favourite</i> ,	140	<i>Albion</i> ,	60
<i>George</i> ,	120	<i>Cecil</i> ,	170
<i>Sir Dimple</i> ,	96		

HEIFERS.

<i>Phæbe</i> , 3 years old,	105	<i>Lacy</i> , 2 years old,	132
<i>Young Duchess</i> , 2 years old,	183	<i>Charlotte</i> ,	136
<i>Young Laura</i> , 2 years old,	101	<i>Johanna</i> ,	35
<i>Young Countess</i> ,	206		

HEIFER CALVES.

<i>Laicilla</i> ,	106	<i>Ruby</i> ,	50
<i>Calista</i> ,	50	<i>Cowslip</i> ,	25
<i>White Rose</i> ,	75		

The total amount of the 47 lots (one being unsold) is £6073 4s. or nearly £130 each.

To illustrate a remark in the prefatory letter, let it be supposed that a bull was sent to America, called "C, got by a son of B C," his dam by "B C;" his g. d. by "P;" his gr. g. d. by "N."

The dam of the son of B C not being given, she was, most probably, a common cow—the gr. gr. g. d. of C, on the female side, not being traced, it is to be presumed she was also a common cow—and the dam of P, which begat C's g. d. not being known, she was also, most probably, a common cow.

Thus C's gr. g. d., on the female side, was half-blood—his g. d. by an half-bred bull, and out of an half-bred cow, was half-bred—his dam, by a full-bred bull, must be three-fourths bred—hence his sire being but half-bred, C can possess but 5-8ths of Improved Short-Horn blood.

THE ORIGIN

OF THE

IMPROVED DURHAM SHORT-HORNS.

Extracts from "IMPROVED SHORT-HORNS AND THEIR PRETENSIONS," by the Rev. Henry Berry, of Acton Rectory, England—a gentleman distinguished not merely as an interesting and scientific writer, but as a sagacious breeder of cattle, who has gained on various occasions, honorary rewards for his Essays, as well as for his beasts.

To the banks of the river Tees, separating the counties of Durham and York, reference is to be had for an account of the originals of the improved Short-horns.—There, upwards of eighty years ago, existed a breed of cattle, for a description of which the author is indebted to an old and celebrated breeder now living,—in colour resembling what is called the improved breed of the present day, except that the fashionable roan was not quite so prevalent; they are described in general character also to have differed very little from their descendants. Possessing a fine mellow touch, good hair, light offal, particularly wide carcasses, and deep fore-quarters, they were also justly celebrated for extraordinary proof when slaughtered,—resembling thus closely their descendants of the present day. * * * *

From all the information which can be collected, it ap-

Celebrated Males in 1730—Studley Bull, &c.

pears that the breed of cattle thus described, was crossed with, and probably improved by, importations from the Continent. Several spirited individuals, at that early period, had devoted much attention to the improvement of the breed of cattle then prevailing in the counties of Durham and York, and, amongst others, Sir William St. Quintin, of Scampston, imported cows and bulls from Holland. In due time, the produce of these animals was more widely diffused, and, crossed with the best stocks of the country, which possessed the same characteristics, became distinguished as the *Teeswater Short-horns*, uniting, in a wonderful degree, good grazing and dairy qualities. * * *

About eighty-five years have elapsed since Mr. Milbank devoted his attention to this branch of rural economy. * * *

A cow, bred from his stock, and at that time the property of Mr. Sharter, of Chilton, slaughtered when twelve years old, having produced several calves, weighed upwards of one hundred and ten stones.* This cow was the daughter of the *old Studley bull*, one of the most celebrated ancestors of the improved Short-horns. He is described to the author by a person who often saw him, to have possessed wonderful girth and depth of fore-quarters, very short legs, a neat frame, and light offal. He was the grandsire of *Dalton Duke*, bred by Mr. Charge, and sold by him, at the then high price of fifty guineas, to Messrs. Maynard and Wetherell, in whose possession he served cows, at half-a-guinea each. From the old Studley bull are also descended *William* and *Richard Barker's*, and *Mr. Hill's bulls*, all animals of the highest reputation in their day, and the originals of the improved Short-horns. * * *

* Or 1540 lbs.

Celebrated Males—Hubback, &c.

Sir William St. Quintin imported several cows and bulls from Holland; and it may be added, that from him Sir James Pennyman, who possessed estates in the counties of York, Durham, and Northumberland, and was desirous to extend this breed further north, obtained the cattle necessary for his purpose. From these he presented six cows and a bull to Mr. George Snowden, of Hurworth. * * * *

In the mean time, a person near Hurworth, having in his possession a cow which there was every reason to believe was bred from some of the stock which had been imported, she was on this account, and from her superior form and quality of flesh, thought worthy to be introduced to Snowden's bull, and her produce afterwards became an object of celebrity as the bull *Hubback*. This cow, when removed from her usual pasture in the highways to good land near Darlington, became so fat that she did not again breed, and was consequently slaughtered. Her son evinced the same extraordinary disposition to fatten, and became useless; which was also the case with *Bolingbroke*, and several of Mr. Colling's best bulls, until he adopted the plan of keeping them in the lowest possible condition. * * * * It shall suffice to remark, that in Mr. C. Colling's bull *Foljambe*, the Barningham and Hubback's blood were united; that this bull was the great grand-sire of *Comet*, and rendered, by Mr. C. Colling's own account, the most essential service to his stock. Should the reader feel desirous to trace the pedigrees of the animals here mentioned, he is referred to "*Coates's Herd Book*," where every particular is faithfully stated. * * * * *

DAIRY PROPERTIES

OF

IMPROVED DURHAM SHORT-HORNS.

From the Rev. Henry Berry's Pamphlet.

The instances which are given as to milk, were obtained by the author on the spot; and though he would gladly have included any others, had they been furnished, it appears to him that no trifling force is afforded to his argument, by the circumstance of the cases which are set forth being derived from one stock,—irrefragable proof being thus furnished that they are not solitary instances, but happening in the regular course.

The cows recorded, are the property of J. Whitaker, Esq.* of Greenholme, near Otley, and are of the most esteemed blood. [*See Herd Book.*] They have given, and give, twice a-day, as follows:—

YELLOW ROSE, AT THREE YEARS OLD, FOUR GALLONS TWO QUARTS, TWICE A DAY.

YELLOW ROSE, AT FOUR YEARS OLD, FOUR GALLONS THREE QUARTS, TWICE A DAY.

RED DAISY, FOUR GALLONS, TWICE A DAY.
(*She is the g. d. of Mr. Powell's Desdemona, and the g. d. of Mr. Powell's Betty, on the male side.*)

* Mr. Whitaker has with singular liberality made great exertion to aid the selection of neat cattle and sheep for Pennsylvania, refusing on all occasions, when animals from his fold were chosen, to fix the prices, leaving them to be determined either by the agent in England, or by his friend in America.—*Am. Ed.*

Mr. Whitaker's Dairy Short-horns.

MAGDALENA, UPWARDS OF FOUR GALLONS, TWICE A DAY.

WILDAIR, FOUR GALLONS, TWICE A DAY. (*The Dam of Mr. Powell's Betty.*)

WESTERN LADY, THREE GALLONS TWO QUARTS, TWICE A DAY. (*The Dam of Mr. Powell's Malcolm.*)

VENUS, SIXTEEN YEARS OLD, THREE GALLONS ONE QUART, TWICE A DAY. (*The g. d. of Mr. Powell's Volante.*)

ALFREDE, THREE GALLONS, TWICE A DAY. (*The g. d. of Mr. Powell's Gloucester.*)

ADELA, FIRST CALF, THREE GALLONS, TWICE A DAY. (*The Dam of the same.*)

YARM, THREE GALLONS, TWICE A DAY. (*The Dam of Mr. Powell's Yorkshire Belle.*)

THESE COWS ARE STEADY MILKERS, POSSESSING GREAT INCLINATION TO FATTEN, AND MR. WHITAKER CANNOT BE TOO HIGHLY COMPLIMENTED ON HIS SUCCESSFUL EXERTIONS TO COMBINE THE TWO QUALITIES. THE REMAINDER OF HIS STOCK WILL BE FOUND BY NO MEANS CONTEMPTIBLE AS MILKERS; BUT IT IS THOUGHT UNNECESSARY TO REMARK UPON ANY ORDINARY QUANTITIES.

WITHOUT ENTERING FURTHER INTO PARTICULARS, THIS SUBJECT MAY PROPERLY BE DISMISSED WITH A REMARK OF MR. C. COLLING'S, THAT THE *DUCHESS* AND *DAISY* TRIBES, WITH WHOSE MERIT AS GRAZIER'S

STOCK, THE PUBLIC ARE WELL ACQUAINTED, WERE ALL GOOD MILKERS, POSSESSING THAT VALUABLE *UNION* OF QUALITIES OF WHICH IT IS THUS OBVIOUS EVERY BREEDER OF SHORT-HORNS MAY AVAIL HIMSELF, WHO CHOOSES TO MAKE IT THE OBJECT OF HIS CARE.

IT REMAINS FOR THE AUTHOR TO REMIND HIS READERS, THAT IT IS OF THE *IMPROVED* SHORT-HORNS HE WRITES, AND NOT OF THE GENERAL HERD OF CATTLE, WHICH ARE SOLD AS SHORT-HORNS, FROM THE NORTHERN DISTRICTS.

[*Improved Short-horns and their Pretensions, page 42.*

And it may be added, nor did he allude to those sent to America without pedigree, or claims to the properties of the high bred race.

The success of Mr. Whitaker's breed in *beating* the Herefords on various occasions, and particularly in 1824, when Wharfedale (by ENCHANTER, dam Miranda*) "*beat*" all the Short-horns, and afterwards *the field*, as well as his triumph at the Doncaster show in 1825, when Matilda, by WESTERN COMET, beat Mr. Champion's, &c., proves that in points and feeding properties, *his families* of Short-horns are not less remarkable than in excellence for the churn.—*Am. Ed.*

* Enchanter is the sire of Malcolm—Western Comet was the sire of Western Lady, Malcolm's dam.—(*See Herd Book.*)

PROOFS OF EARLY MATURITY,

AND

LARGE RETURNS FOR FOOD CONSUMED.

A heifer, three years old, by a grandson of the old Studley bull, bred by Miss Allen, of Grange, fed on hay and grass alone, weighed 1260 pounds.

Mr. George Coates slaughtered a heifer, by Snowden's bull, the sire of Hubback, fed on turnips and hay, which weighed 952 pounds, at two years and two months old. * * *

Thus much for the Tees-water cattle, the *originals* of the improved Short-horns. * * *

From this breed of cattle, possessing such recommendations, Mr. Charles Colling selected his original stock. * *

Mr. Arrowsmith, of Ferryhill, who fed his Short-horns at two years old—

In 1801, sold four for £25 each, two steers and two heifers.

1802, sold six for £17 10s. each, three steers and three heifers.

1803, sold four for £17 0s. each.

1804, sold six for £18 10s. each.

1805, sold six for £17 10s. each, two steers and four heifers. * * *

The time for selling from the beginning to the latter end of May.

Fat Cattle—Modes of Feeding.

They were managed as follows:—In the first winter they got straw in a fold-yard, with nearly as many turnips as they could eat. In May they were turned to grass; in November put to turnips through the winter, and turned out to grass the first week in May.

A twin heifer, belonging to Mr. Arrowsmith, calved the last week in April, being kept the first year as the common stock, was entered for a sweepstakes to be shown in June, when two years old, and was then put to grass, with other stock of the same age, in the usual pasture. In November she was estimated to weigh 392 pounds, when she was put to ruta бага, and hay and oil cake, of which she ate four hundred weight, with two bushels of bean-meal, and one bushel of barley. She went to grass on the first of May, and had, from that period, neither cake nor corn. On the 23d July, it was the unanimous opinion of the best judges, that she weighed 812 to 840 pounds, having gained 420 pounds in thirty weeks. * * * * *

Mr. Walton, of Middletown-in-Tees-dale, had been (in 1808) in the habit of selling his steers at two years and a quarter old, for £20 to £30 each, their weight being from 700 to 756 pounds.

His mode of keeping is as follows:—The cows seldom calve sooner than April; the calves get new milk for the first three weeks; after that a moderate quantity of scalded skimmed milk, mixed with oil cake boiled in water, about two quarts of each, along with good hay, for about three weeks; after which they do very well in the pastures, without any kind of hand feeding, until the latter end of November, when they are treated in the same way as Mr. Arrowsmith's, and never get either cake or corn.

Major Rudd's Steer—Cows—Deep Milking.

Mr. Mason, of Chilton, in the course of an experiment to ascertain the weight of beef gained by the food given (turnips), found three steers, under three years old, to have gained 280 pounds each in twenty weeks. The three animals averaged 980 pounds each. * * *

A steer, bred by Mr. Simpson, of Aycliffe, and fed by Mr. C. Colling, on grass, hay, and turnips, weighed, when slaughtered, at four years old, 1890 pounds. * * *

A cow, by Mr. Coates' bull Houghton, bred by Mr. Foljambe, and slaughtered at Sheffield, when twelve years old, weighed 1395 pounds. Both these animals appeared very small.

Major Rudd, of Marton-in-Cleveland, obtained the premium offered by the Cleveland Agricultural Society, in 1811, for the best steer, under three years old, fed on vegetable food.* The steer he exhibited was sold to the butcher for ten shillings per stone, and slaughtered when three years and thirteen days old: the weight of his four quarters 1344 pounds. * * *

Sir Charles Morgan's four years old ox, by Furioso, weighed, four quarters, 2058 pounds.

That Short-horned cows, of the improved breed, having high pedigrees, and the greatest tendency to fatten, not only give a sufficient, but, in many cases, an extraordinary, quantity of milk, the preceding account of that breed has satisfactorily shown; and the instances of the latter are sufficiently numerous to present to any person, desirous of combining the two qualities, the opportunity of selecting a stock productive for the dairy, and inferior to none for the grazier's use.

* * *

* *i. e.* without corn, cake, or meal.

Short-horns and Herefords compared.

A Short-horned steer of Colonel Cooke's, fed on *potatoes and straw*, was slaughtered when two years and twenty-two days old. His four quarters weighed 1008 pounds. * *

“ Dalkeith, Mid Lothian, Jan. 12th, 1824.

“ Sir,—I observed in your paper of the 22d December last, that an interesting exhibition of live stock had taken place at Smithfield; the age and weight of some, you state as follows:

“ A Hereford ox, six years old, weighing one hundred and ninety-nine stones* six pounds.

“ A ditto, three years and nine months, weighing one hundred and forty-three stones two pounds.

“ In the same paper you take notice of some exhibition of a similar kind in this quarter. * * * * *

“ In reference thereto, I beg to state, that Mr. John Rennie, of Phantassie, produced at the show of fat cattle, before the East Lothian United Agricultural Society, in November last (of which I had the honour of being one of the judges), six steers of the pure Short-horn or Tees-water breed, from eighteen to twenty months old, for which the first premium for fat and symmetry was awarded. Three of the best he is keeping on for another year, to ascertain the improvement they will make, and the other three were sold to a friend of mine in Edinburgh; the dead weight, or four quarters, of one of these weighed one hundred and eighteen stones one pound, or 1653 pounds.

* It may be proper, in this place, to remark, that whenever, throughout this work, the weight per stone is stated, the stone of fourteen pounds is intended, unless another rate of computation be particularly expressed.

Short-horns and Herefords compared.

“The same gentleman presented at the Highland Society’s competition of fat stock, in November last, several of the same breed, which also carried the premiums for symmetry and fat. Two of these I purchased, viz.—one aged two years and four months, four quarters weighing one hundred and fifty-three stones seven pounds, or 2149 pounds; and one aged three years and six months, four quarters weighing one hundred and sixty-nine stones seven pounds, or 2373 pounds. The last mentioned had (besides) thirty stones one pound, or 421 pounds of rough fat, all Smithfield weight.

Your most obedient servant,

“WILLIAM PLUMMER,

*“One of the judges of fat cattle, of the
East Lothian Agricultural Society.”*

“To the Editors of the Farmer’s Journal.”

Before this extract is dismissed from the reader’s notice, let him apply the following test to the Hereford breeder’s position and objection, and himself decide upon their title to public regard:—

	<i>lbs.</i>
A Hereford ox, six years old, weighed	2792
A Hereford ox, three years and nine months old	2004
A yearling Short-horned steer	1652
A Short-horned steer, two years and four months old	2149

* * * * *

The Short-horns are uniformly docile, and gentle in the extreme, the bulls scarcely ever becoming mischievous, and the cows and heifers permitting access under all circumstances, and for every needful purpose. The Herefords are the very reverse.

Pedigree essential—700 guineas for a Cow.

MESSRS. COLLINGS HAVE FREQUENTLY SOLD COWS AND HEIFERS FOR 100*l.* AND BULL CALVES AT 100*l.* MR. CHARLES COLLING HAS REFUSED 500*l.* FOR A COW; AND IN 1807, MR. MASON REFUSED 700 GUINEAS FOR A COW.

THESE GENTLEMEN LET BULLS OUT BY THE YEAR: THE PRICES FROM 50 TO 100 GUINEAS; AND THE PUBLIC ARE SO FULLY CONVINCED OF THEIR MERITS, THAT THESE CELEBRATED BREEDERS CANNOT SUPPLY THE DEMAND FROM THE PURE BLOOD, WHICH THEY ARE AS CAUTIOUS OF PRESERVING, AS THE AMATEURS OF THE TURF ARE THE BREEDS OF THEIR RACE HORSES, AND WHICH THE TAKERS OF BULLS ARE BECOME SO WELL ACQUAINTED WITH, THAT THE PRICES THEY GIVE, ARE IN PROPORTION TO THE GOOD QUALITIES OF THE INDIVIDUALS, AND MERITS OF THEIR PROGENITORS—MORE REGARD BEING PAID TO THEIR PEDIGREE THAN TO ANY THING ELSE; FOR THIS PURPOSE THEY HAVE BOOKS CONTAINING THE FULL PEDIGREE OF THEIR STOCK, SIMILAR TO THE STUD BOOK OF RACE HORSES, BY WHICH ANY PERSON WANTING TO PURCHASE ANY OF THEIR STOCK, OR TO HIRE BULLS, MAY SEE HOW THEY ARE DESCENDED.

The DURHAM OX was bred by Mr. Charles Colling, of Ketton, in the year 1796: his form and nice handling, indicated every disposition to fatten at an early age, and the expectations entertained of him by the best judges, were not

Durham Ox—Weight not determined by Size.

disappointed: at five years old he was not only covered thick with fat upon all the principal points, but his whole carcass in a manner loaded with it, and was then thought so wonderful an animal, and so far exceeding whatever had been seen before, that he was purchased to be exhibited as a show, by Mr. Bulmer, of Harmby, near Bedale, in February, 1801, for 140*l.*: at this time he was thought to weigh 168 stones, his live weight being 216 stones, (14 lbs. to the stone): this did not arise from his superior size:

Mr. Bulmer got a proper carriage made to convey him in, and after travelling with him five weeks, sold him and the carriage at Rotherham, to Mr. John Day,

	£.	s.	d.
On the 4th of May, 1801, for	250	0	0
On the 14th May, Mr. Day could have sold him for	525	0	0
On the 13th June, for	1000	0	0
On the 8th July, for	2000	0	0

Mr. Day preferred keeping him, persuaded that his merits were such, as would insure him a greater return: but these prices are strong proofs of his very superior excellence, to whatever had been seen in those districts before.

Mr. Day travelled with him nearly six years, through the principal parts of England and Scotland, and arrived at Oxford, in February, 1807, where, on the 19th, the ox by accident dislocated his hip bone, and continued in that state until the 15th April, when he was obliged to be killed; and notwithstanding he must have lost considerably in weight, during this eight weeks of illness, yet his carcass weighed

Twenty-eight Short-horns sold for \$22,948.

	<i>sts.</i>	<i>lbs.</i>	
Four quarters	165	12	(14 lbs. to the stone.)
Tallow	11	12	
Hide	10	2	

This was his weight at 11 years old, under all the disadvantages of six years' travelling in a jolting carriage, and eight weeks of painful illness: had he been kept quietly at Ketton, and properly fed until seven years old, there is little doubt but he would have weighed more than he did at ten years old, at which age Mr. Day states his live weight to be nearly 34 cwt. or 270 stones.

From which if there be taken for offal 50 ditto.

Leaves the weight of the carcass 220 stones.

Extract from the Memoirs of the Pennsylvania Agricultural Society.

It appears by Bailey's Survey of Durham, that at Colling's sale in 1810, seventeen cows were sold for 2,802 pounds 9 shillings sterling—eleven bulls for 2,361 pounds—twenty-eight animals, thus produced \$22,948 67. That Major Rudd paid 400 guineas for Lady of 9 years—for Lily 400 guineas—for Peeress 170 guineas—for Petrarch 375 guineas; that Messrs. Wetherill & Co. paid for Comet of 6 years, 1000 guineas. Mr. Champion, and Col. Mellish have since paid 450 guineas, for the services of Charles, during 2 years. A regular record is kept, in the Herd Book, of the pedigrees of the animals of pure blood. Although one hundred and forty breeders—130 bulls and nearly 3000 heifers and cows, are enumerated in this volume, it will be seen, by Major Rudd's letter, that their cost continues to be as high as it was 17 years since.

Mode of rearing—Food—Turnips—Straw.

Extract of a Letter from a Gentleman distinguished as one of the most successful breeders in England.

“Mr. Whitaker’s mode of rearing Improved Durham Short-horns is nearly the same, as that of the breeders in the north. Bull calves run with good nurses, until about six or eight months old—from that age until about one year old, they have hay, turnips, and a little linseed cake, afterwards hay and turnips, or grass.

“Heifer calves are taken from their dams when about three weeks old, are put to cows, giving about half the usual quantity of milk, or two calves are put to one cow “full of milk.” With them, they run in the pastures until September, when they are put to “fog.” So soon as the weather becomes severe, they have a shed, or house to run into, with straw and turnip tops, and sometimes a little linseed cake. The following summer they are put to grass, without any thing else, until the winter, when they have straw and turnips, as the dry cows; but when in milk they have straw, turnips, a little linseed cake, or a little bean meal: “for milk,” he observes, “we must have.” Bean meal produces more milk than linseed cake, but cake answers better for producing flesh and fat. This method of rearing calves is found quite as economical as by the pail.

“When the stock have fairly begun to feed, he considers it most profitable to give them as much of the best food as they will eat, taking care that the food of all kinds is consumed before they have a fresh supply; and that every thing about them is kept clean.

“First in the morning a little hay is given, next a few tur-

Western Comet—Excellence as a Sire.

nips, after, about six pounds of cake—in the afternoon, the same routine is observed.

“No apology, I assure you, was necessary in addressing your letter of December last to me, on agricultural subjects. The perusal of it, and the book which you were so kind as to send, gave me great pleasure. My experience justifies me in saying that I coincide with your observations in general. Comet certainly gained great celebrity, yet his produce were mostly unequal to himself. It is said ‘like begets like,’ but this bull never was the father of as good a one as himself; it was otherwise with his sire. Favourite stamped all his offspring as superior to himself—perhaps no bull ever begat so many good bulls and cows.

“Hubback stands first with most breeders, but from all I can collect from the oldest breeders, particularly Mr. —, who has excellent judgment, and had a better opportunity of seeing the stocks of the Collings, Charges, Maynards, &c. than any other man, being at that time a breeder, and almost daily with them, I believe the *STUDLEY WHITE BULL* was unequalled by any of his day. Mr. — says he had the best and greatest fore-quarters he ever saw, with as great an inclination to fatten. Mr. Charge used him five or six years, and till of late years all his stock were descended from him.

“I am happy to confirm your opinion, (*I speak from long experience,*) that selections may be made of good milkers from the *purest* blood. Mr. Whitaker is largely concerned in the cotton business, and having to *provide milk for a large establishment* in 1810, he attended Mr. Charles Colling’s sale. At the same time he saw a yearling bull at Mr. Charge’s, which he bought, and afterwards named *WESTERN COMET*. This bull, I may say, never begat a bad animal—they all proved great graziers, with the best backs, quarters, crops, &c. &c., of any I ever saw.

Frederick—Western Lady, &c.

“I agree with you, that when a full blood dairy cow has rest, she will lay on fat as quick as the grazing tribe—consequently for most purposes, this kind is undoubtedly the best, and in the end most profitable.

“MR. WHITAKER’S FREDERICK* is much admired, and answers your description. His head is good—horn small and beautiful—neck fine—shoulders lay well—breast good and prominent—girth and crops good—barrel very good—hind quarters long and handsome—tail fine and tapering—huggins and flank extraordinary—touch mellow, and hide not too thin, with an excellent quality of meat under it—plenty of hair, mossy, &c.—and to conclude, he stands upon fine boned legs.

“I should prefer a cow yielding about three-gallons a meal (i. e. 24 quarts a day) ale measure, to one giving more. The best milkers have descended from the DAISYS, DUCHESSES, and WILDAIRS.

“When I was in search of a bull for you in March last, I informed Mr. — what I wanted. He replied—if I wanted one, I should go to Mr. WHITAKER’S fold, for we have nothing so good in this country as FREDERICK’S stock.

“WESTERN LADY exceeds all Mr. Whitaker has ever had, for both purposes, i. e. milking and feeding.”

Thus it appears from various sources, “that there is a dairy, as well as a grazing or feeding tribe of Improved Short-horns;” that the STUDLEY BULL—HUBBACK—FOLJAMBE—and FAVOURITE, were the most celebrated bulls of their day—that *from them have descended the very best animals* of the race; and that *to them* the breeders are most anxious to trace the origin of their Short-horn stock; and it will be found,

* Frederick is the sire of Gloucester—Bolivar—Volante—Yorkshire Belle—Lady Betty—and Desdemona.

Deep Milking—24 to 32 quarts per day.

on reference to the Herd Book, that SNOWDEN'S—ROBSON'S—WAISTELL'S—BROWN'S—BARKER'S—SMITH'S—JOLLY'S—ALCOCK'S and MASTERMAN'S bulls, were the males from which these bulls were derived.

It may be seen by the Rev. Mr. Berry's pamphlet—the foregoing extracts—and by other sources, that the DUCHESS, DAISY, and WILDAIR strains, are evidently those which are considered the most valuable for dairy purposes. And to the same pamphlet reference may be had to prove, how completely this opinion is established, by THE DAIRY PROPERTIES OF MR. WHITAKER'S COWS, many of them yielding from 24 to 32 quarts per day.

Extract.

“We have also examined the Durham Short-horned cattle. We have never seen animals better fitted for the yoke in gait; the bull, although appearing heavy from his round shape, moves with great vigour, and places his feet so accurately, that the tracks made with his fore feet, are occupied by his hind feet as he advances. The heifers also move with alacrity, and have very straight legs.

“We are all dairy farmers, and have visited Powelton at our own suggestion, to satisfy our minds as to the dairy properties of the females. We do not hesitate to say that they have all the appearance of great milkers, having also yellow skins. We think the heifers excel in these points, all which we have seen.

LLOYD JONES,	ISAAC W. ROBERTS,
PAUL JONES,	DAVID ROBERTS,
JOHN ROBERTS,	JOSEPH TRASEL,
GEORGE W. ROBERTS,	ISAAC HESTON.

Philadelphia County, Jan. 10, 1826.

[See American Farmer, vol. 7, page 361.]

ON THE
PROFITS AND GENERAL ADVANTAGES
ARISING FROM
IMPROVED BREEDS OF CATTLE.

York, (Penn.) September 23, 1826.

SIR,—I write to give you some idea of my progress in the stock way, and I can now speak largely of my profits arising from Yorkshire* and Hebe;† enough to satisfy any farmer that they are much the most profitable investment of so much money that can be obtained. Within the last eighteen months, the services of Yorkshire have brought, according to an account kept by the person who has the charge of him at the farm, \$200 clear of expenses. I have also one noble bull calf from Hebe, now eight months old,

* YORKSHIRE, got by Mr. Carpenter's Lothario, dam an imported cow selected in England expressly for dairy purposes.

Mr. Carpenter's *Lothario*, begotten in England by Mr. Ashcroft's George, dam Moss Rose, imported in 1821, by Fish and Grinnell.

† HEBE, got by Rob Roy, dam by Sampson; g. d. Betty; gr. g. d. Old Betty.

Rob Roy, got by Young Denton, dam Brindle by Mr. Lee's imported bull. *Sampson*, by son of Ossian, dam by Comet.

which I think I may value at \$200. I have also twelve half bloods which I can dispose of at from \$20 to \$40 each under a year old, making an income of at least \$400 on a capital of about \$400, and that capital itself improved one half more in value. This is not mere paper profit, but substantial value that can be tested, and I am well satisfied that with a little enterprise, every county in the state would afford three or four establishments as profitable as mine, and of great public utility.

Pennsylvania now pays a large annual sum to Virginia, Kentucky, Ohio and New York, for the finer kinds of stock cattle. I am informed that we pay to New York alone not less than \$150,000 annually for cattle; and owing to the circumstance that breeders of cattle in the western parts of New York have, for some years past, attended to the selection and improvement of their stock, it finds a ready market, and commands one-fourth more per hundred, than cattle raised in the interior of Pennsylvania. We have vast bodies of waste lands in this state, even in our mountainous districts, which are well adapted, as the lands in New York, for rearing neat cattle and sheep, and certainly have the advantage in climate. I am persuaded, nothing more is wanting to render us altogether independent of our more enterprising neighbours, than two or three years' attention to our breeds of stock.

Profits of good Breeds.

Of all the different races of cattle to be found in Pennsylvania, none can compare with the Durham Short-horns in the essential qualities of good stock, early maturity, easy keep, &c.; and although it would be impossible for many individuals to obtain the full blood, yet I am confident that a few full blooded males in each county, would soon realize handsome profits to the enterprising owners, and in the course of a few years would perpetuate an improved stock to the exclusion of the miserable stunted race which now lumbers our farm yards.

This, sir, is a subject of no common importance, and if the great exertions and sacrifices you have made were properly seconded by the enterprise of our farmers, we should soon have reason to hail your introduction of this fine race into our state, as a most important era in our agricultural economy.

I shall from time to time trouble you with an account of my improvements in the article of stock, and shall be happy in receiving any occasional hints on the subject that you may deem useful.

I am, very respectfully,
Your obedient servant,
CHARLES A. BARNITZ.

JOHN HARE POWEL, ESQ.
Cor. Sec'y Penn. Ag. Soc.

On Cattle for the Dairy and Stall.

On the "dairy and feeding" properties of Improved Short-horns, by Dr. Elmer.

Bridgeton, (N. J.) January 9th, 1827.

SIR,—It affords me much pleasure to be able to communicate to you the result of my labours to improve my stock, and the high opinion which I entertain of *the Improved Short-horns for the dairy and stall, confirmed by personal observation, and actual experience, with those in my possession.*

In making a selection of animals for the purpose of improving my stock, I commenced by purchasing of Col. Powel, in the year 1823, a cow of one-fourth blood—the next year one of three-fourths blood, and a full blooded male—since that, others of different degrees of blood, and *some* of pure blood, both male and female; thus gradually progressing from year to year through different grades of blood, until I have attained the *pure stock*.* In pursuing this course, I have observed *that the nearer I approached the pure blood, I found them to be more hardy, subsist on less, and keep in better condition on short pasture, than any of my other stock.* From them I

* JILT, got by Bishop, dam Lucinda by Young Denton; g. d. Star; gr. g. d. Milker.

KATE, got by Bishop, dam by Sampson; g. d. Betty; gr. g. d. Old Betty.

OSAGE, light roan, bull, calved in 1826, by Wye Comet, dam Virginia.
(See the pedigrees of Virginia and Wye Comet.)

FLIRT, by Young Denton, dam Julia by Young Denton; g. d. an imported Devon cow.

have bred calves of the most promising appearance, and greatly excelling those of any other breed that I have seen.

I have at this time three half blood yearling steers which are remarkable for size and condition, very docile, and in their general appearance are superior to any other cattle in this part of the country. They grazed during the last season (from May until the middle of November) on high land pasture, and continued improving so fast as to attract the attention of many of the neighbouring farmers, notwithstanding the severity of the drought, and the great annoyance of the flies and moschettos which literally *swarmed* with us during the season. *In regard to their dairy properties, they are equal to those of any other breed.*

I am, with much esteem,

Yours, &c.

WILLIAM ELMER.

JOHN P. MILNOR,

Rec. Sec. Penn. Ag. Soc.

On the Excellence of Devon Cattle for the Yoke—

On the superiority of Improved Short-horns for the dairy and shambles, and their vigour and fitness for labour. By a successful practical farmer of Connecticut.

Goshen, (Conn.) January 22d, 1827.

SIR,—I live in a section of the country where the dairy forms a very conspicuous part of the

income of the farmer, and where very considerable attention is paid to the raising of cattle of the finest description, and possessing the most valuable and useful qualities. I have been acquainted with a number of distinct breeds of cattle of English importation. I have been very intimately acquainted with *Devons* imported from Mr. Coke's stock in 1817, having myself procured and kept some of the best blood in the possession of Messrs. Patterson and Caton, of Baltimore, importers of the stock.

I have had considerable acquaintance with the Improved Durham Short-horned stock—have visited the farm of Mr. Powel, and viewed the stock in his possession, and by him imported—and do not hesitate to express my opinion decidedly in favour of that breed of cattle as possessing more valuable and intrinsic qualities than any other which have ever come under my observation.

For the yoke I do not consider them superior to *Devons*, and yet I see no reason why they are not very well calculated for the labour of the yoke, as they certainly possess good constitutions, are vigorous in their motions, and walk with speed and facility. But for the more common and useful purposes of fattening and the dairy, they far surpass any description of their species, combining great symmetry of form with superior size—rapid growth and an unusual apt-

Mr. Carpenter's trial of Short-horns.

ness to fatten. Such is my entire conviction of their great superiority and excellence, that I have procured a bull* from Mr. Powel's stock, with whose progress and improvement I am extremely well satisfied.

Very respectfully,

I remain yours, &c.

T. TOWNER.

To the Secretary of the Pennsylvania Agricultural Society.

*Carpenter Hall, Lancaster, (Pennsylvania),
January 22d, 1827.*

DEAR SIR,—After a period of nearly five years in breeding Short-horned cattle, I venture to give my opinion, as far as my experience will allow.

The crosses between the Short-horns and our native cattle, and the continuation with the Short-horns until we get seven-eighths or fifteen sixteenths of the blood, all appear to be well adapted to our climate, and are remarkable for the thickness of their coats.† Most of the Short-

* WARWICK, calved in 1825, red roan (bred by Mr. Powel) got by Wye Comet, dam Belle, imported in 1824 (bred by Mr. Taylor); g. d. Lady (bred by Mr. Taylor); gr. g. d. by Comet.

Belle's calf *Beau*, took the first premium at the Pennsylvania Cattle Show of 1825, and also a premium at the Cattle Show of 1826.

[See *Wye Comet's pedigree*.

† Long and close hair is one of the characteristic marks of the Improved breed.

horn cows that I have seen have all the marks of deep milkers. One of my half blood cows by Denton, brought forth a calf in May last, and the calf for some weeks continued to suck but two teats, both on the same side of the udder, which was one-half the milk. From the remaining two teats, I saw drawn regularly every day two buckets of milk, containing about three gallons each. This cow got nothing but the grass, and grazed with my other cows.

The next thing to be considered is the fitness of these cattle for the shambles, of which I could not give an opinion without seeing some of them slaughtered, as it would be impossible to say how they would cut; but as it regards their aptitude to fatten, and their early maturity, I give it as my opinion, that they surpass every other breed of cattle that I have ever seen. My steers of three years old were perfectly fat last summer on the grass, and some rising two years were quite fat; they are much more easily wintered, and will feed much better on straw and rough food, than any other breed of cattle.

I am, &c.

Most sincerely yours,

H. A. CARPENTER.

Extraordinary Cow, yielding $20\frac{1}{2}$ lbs. of Butter per week

JONATHAN ROBERTS, Esq.

President of the Pennsylvania Agricultural Society.

Philadelphia County, May 31, 1827.

DEAR SIR,—My residence, as you know, adjoins Powelton. My intimacy with Mr. Powel, and the interest I take in his agricultural pursuits, particularly in the breeding of live stock, have made me familiar with the details of his farm, and the management of his cattle. I enclose various depositions taken by George C. Lentner, Esq., of Blockley, showing that an IMPROVED DURHAM SHORT-HORNED COW, called Belina, produced milk between Thursday morning the 24th inst. and Saturday evening the 26th, i. e. in three days, from which eight pounds thirteen ounces of butter were obtained *by the usual process, at the rate of $20\frac{1}{2}$ pounds per week.*

This cow has had no other food than slop of Indian meal, clover and orchard grass, and has yielded repeatedly by measurement, and so far as can be ascertained by the bucket, continues to yield, twenty-six quarts within the twenty-four hours.

I carefully superintended the trial recorded, and *sufficiently know the parties who were employed in the operation, to believe their statements, independently of the ocular demonstration which I have had.*

I am, dear sir,

Most faithfully yours,

JOHN P. MILNOR,

Recording Secretary.

Philadelphia County, ss.

Personally appeared before me the subscriber, one of the Justices of the Peace, in and for the County aforesaid, Thomas Morrison, who being duly affirmed according to law, deposeth and saith—

That he has been employed as foldman at Powelton for nearly nine years; that he has milked the cow called Belina, since she was imported in 1825; that he has never seen nor heard of any extraordinary management, either of this or of any other cow, nor of the milk upon the Powelton farm; that all the milk given by Belina, from Thursday morning the 24th ult. until Saturday evening following, was drawn and kept separately; that no mistake could be made, as all the cows which were not dry, had been, and are yet, upon distant meadows, excepting Belina, and another, whose milk supplied her calf, a month old, running at her side, and the family, during the time mentioned, which milk was always sent immediately into town from the field.

Affirmed before me this first day of June, in the year of our Lord one thousand eight hundred and twenty-seven.

GEORGE C. LENTNER.

Philadelphia County, ss.

Personally appeared before me the subscriber, one of the Justices of the Peace, in and for the County aforesaid, Sarah Sterling, who being duly affirmed according to law, deposeth and saith:—

That she received from Thomas Morrison

Belina's milk from Thursday morning the 24th inst. until Saturday evening following; that it was merely strained and put into common milk pans in the Spring House, from which every drop of milk had been previously removed; that there could be no mistake, as the key of the Spring house door was kept by her, and no person was allowed to enter, excepting with her; that several persons on the farm daily counted the milk pans, and noticed all that was done.

Affirmed before me this thirty-first day of May, in the year of our Lord, one thousand eight hundred and twenty-seven.

GEORGE C. LENTNER.

Philadelphia County, ss.

Personally appeared before me the subscriber, one of the Justices of the Peace, in and for the County aforesaid, Maria Sturgis, who being duly affirmed according to law, deposeth and saith:—

That on Monday night the 28th inst. she skimmed the milk which Sarah Sterling had received from Thomas Morrison between Thursday morning and Saturday evening immediately preceding; that she churned it the next day (Tuesday) and obtained *eight pounds and thirteen ounces of butter, which was weighed by Mr. Milnor in her presence.*

She further saith that she measured, on Wednesday the 30th inst., a quart of cream taken from Belina's milk, that she churned it, and obtained one pound five ounces and a quarter of an ounce of butter, which was also weighed by Mr. Milnor in her presence.

Affirmed before me this thirty-first day of

Extraordinary Cream of an Improved Short-horned Cow.

May, in the year of our Lord, one thousand eight hundred and twenty-seven.

GEORGE C. LENTNER.

*Extract from the Minutes of the PHILADELPHIA
SOCIETY FOR PROMOTING AGRICULTURE, May
15, 1827.*

John Hare Powel having presented some cream, accompanied by the following statement, R. Haines, Esq., was appointed by the Chairman to ascertain, by a stop-watch, the time necessary to convert it into butter. Whereupon he reported that it required three seconds, which was received unanimously, as the members witnessed the fact.

R. Haines stated that he had questioned the servants, and was satisfied that no preparation had been required.

The cream was produced from an Improved Durham Short-horned cow, bred by J. Whitaker, Esq., of Burley, England, and now in the possession of John Hare Powel, Esq.

W. S. WARDER, *Secretary.*

Philadelphia, 5mo. 31, 1827.

“This cream was skimmed by me on Sunday morning, from milk which was taken from the cow on Saturday evening. It had stood from eight o'clock until seven the next morning. Nothing was done to it but as common. I strained it with the milk used for the family, and placed it in a common milk pan in the vault.

“ELIZA TAUSIAS.”

Extraordinary Cream of an Improved Short-horned Cow.

From Wilson Jewell, M. D.

West Philadelphia, June 11, 1827.

JOHN P. MILNOR, Esq.

Dear Sir—It affords me pleasure to answer your polite note, dated the 8th inst., and I do not hesitate to add my testimony for the correctness of the statement published a few days since, in reference to the Improved Short-horned Durham Cow, owned by J. H. Powel, Esq.

Attracted by an account of so extraordinary and novel a nature, I visited Powelton, in company with two of my friends, and had the gratification of converting cream into butter in less time than two minutes,* in a teacup, aided by a spoon. The cream was of the consistence of curd, and the quantity of milk shown, being the morning's production from one cow, as far as I was competent to judge, appeared little short of fourteen quarts, far exceeding my most sanguine expectations, both as regards richness and quantity. Very respectfully, your friend,

WILSON JEWELL.

From the Rev. Joseph H. Kennard.

Hamiltonville, June 16, 1827.

JOHN P. MILNOR, Esq.

Respected Sir—My visit to Powelton, in company with Dr. Jewell and Rev. D. Jones, was short but very gratifying; every thing we beheld gave us the impression, that the proprietor was judicious in his plans and persevering in their accomplishment.

With regard to my convictions of the truth of what has been published in relation to the extra-

* It required, on this occasion, a longer time than usual, as the cream was very fresh.

On the Saccharum of the Sweet Potato.

ordinary cow, I am free to say, that from all I saw, and from the statement of Mrs. Sturgis, the account published in the Saturday Evening Post, of the 9th inst., appears to be a correct statement of facts.

And further, it appears of the greatest importance to the interests of our farmers, that the Improved Durham Short-horned breed of Cows be extensively propagated.

Cordially wishing Col. Powel success in his laudable efforts, I am Sir, very respectfully, yours,

JOSEPH H. KINNARD.

On the Saccharum of the Sweet Potato (Convolvulus battatas).

BY ROBERT HARE, M. D.

Professor of Chemistry in the University of Pennsylvania.

Dr. Tidyman, of South Carolina, lately supplied me with some sweet potatoes, of a kind in which sweet matter is peculiarly abundant, and requested that I would ascertain if there were any sugar in them. Having pared, and by means of the instrument used for slicing cabbages or cucumbers, reduced them to very thin slices; about a pound was boiled in alcohol of the specific gravity of .845, which appeared to extract all the sweetness, yet on cooling yielded no crystals of sugar. The solution being subjected to distillation, till the alcohol was removed, an uncrystallizable syrup remained. In like manner, when aqueous infusions of the potatoes were concentrated, by boiling or evapo-

Sweet Potatoes—mode of preparation for Beer.

ration, the residual sirup was uncrystallizable. It appears therefore that the sweet matter of this vegetable is analogous to molasses, or the saccharum of malt.

Its resemblance to the latter was so remarkable, that I was led to boil a wort, made from the potatoes, of proper spissitude, say s. g. 1060, with a due quantity of hops, about two hours.

It was then cooled to about 65 degrees, and yeast was added. As far as I could judge, the phenomena of the fermentation, and the resulting liquor, were precisely the same as if malt had been used. The wort was kept in a warm place until the temperature 85 F. and the fall of the head showed the attenuation to be sufficient.* Yeast subsequently rose, which was removed by a spoon. By refrigeration a further quantity of yeast precipitated, from which the liquor being decanted became tolerably fine, for new beer, and in flavour, exactly like ale made from malt.

I have computed that five bushels, of potatoes, would produce as much wort as three bushels of malt; but I suppose that the residue would, as food for cattle, be worth half as much as the potatoes employed.

I believe it possible to make as good liquor from malt in this country, as in England, but that in our climate much more vigilance is required to have it invariably good, principally because the great and sudden changes of temperature, render malting much more precarious. Should the saccharum of the sweet potato, prove to be a competent substitute for that of germinated

* In passing to this state, there should be a loss in gravity of about 4 per cent.

Sweet Potato Yest, fitted to raise Bread.

grain, the quality will probably be less variable, since its development requires but little skill and vigilance.

Besides, as it exists naturally in the plant, it may be had where it would be almost impossible to make, or procure malt. Hops, the other material for beer, require only picking and drying to perfect them for use.

They are indigenous in the United States, and may no doubt be raised in any part of our territory.

I have dried in my evaporating oven, some of the sweet potatoes in slices. It seems to me that in this state they will keep a long while, and may be useful in making leaven for bread. They may take the place of the malt necessary in a certain proportion, to render distiller's wash fermentable. The yest yielded by the potato beer, appeared in odour and flavour, to resemble that from malt beer surprisingly, and the quantity, in proportion, was as great. In raising bread it was found equally efficacious.

I propose the word *suavin*, from the Latin *suavis*, sweet, to distinguish the sirup of the sweet potato. The same word might, perhaps, be advantageously applied as a generic appellation to molasses, and the uncrystallizable sugar of grapes, of honey, and of malt.

Crystallizable sugar might be termed *saccharin*, since the terminating syllable of *saccharum* is appropriated in chemistry to metals.

JOHN HARE POWEL, Esq.

Cor. Sec'ry of the Pennsylvania Agricultural Society.

Dairy Short-horns—Cream, &c.—Tried in America.

American Proofs of Dairy Properties.

Philadelphia, 3d Mo. 1, 1826.

ESTEEMED FRIEND,

I thank thee for the pitcher of cream, the product of one* of thy *Short-horned Cows*. No stronger proof of the value of that family of animals for the dairy, need be furnished, than the specimen before me. A portion of the cream was subjected to friction, by means of a spoon and plate, and it yielded butter of fine flavour, in rather more than a minute. I could scarcely credit, what my own hand had effected. The farmers of our country will surely adopt this profitable race of stock, for the introduction of which into Pennsylvania, they, as well as our fellow citizens generally, are indebted to thy practical judgment, and disinterested zeal.

With great regard and respect,

I am, &c.

ROBERTS VAUX.

JOHN HARE POWEL, Esq.

From Dr. Harris, Vice President of the Pennsylvania Agricultural Society.

Chester County, April 2, 1826.

JONATHAN ROBERTS, Esq.

President of the Pennsylvania Agricultural Society.

DEAR SIR,—The interest you take in all matters connected with the improvement of farm

* It was from three cows.

stock, makes it unnecessary for me to apologize for giving a detail of an experiment to test the richness of cream afforded by Mr. Powell's Improved Short-horn Cows.

The cream was evidently fresh, and was stated to have been taken from milk twenty-four hours old. It was converted into butter in my presence, in a quarter of a minute, whilst I held the watch in my hand, although it had been skimmed but half an hour.

I have interrogated the person by whom it had been skimmed, and under whose inspection the milk had been deposited.

I am satisfied from her statement, and that of the person on the farm, that no extraordinary care, nor management, nor food, have been employed to produce such result.

Very truly, yours,

WM. HARRIS.

Letter to the Editor of the New England Farmer.

My residence adjoins Powelton. I visit it almost daily. I have during nearly five years been in the habit of inspecting the stock. I am familiar with all the arrangements of the farm, and have in the present instance, interrogated the foldman. The cream to which Mr. Vaux adverts was produced by three cows—one

of them Belina, noted in the certificate of the keeper of the Herd Book to have given daily 32 quarts in England—another, the second best milker on the farm, none of them having been fed at any time in an extraordinary way. Belina has a large fat male calf, produced in February, constantly at her side, and which, at this time* cannot take all the milk, although the pasturage is so bare from the excessive drought, that two Maryland farmers yesterday observed it was like that of Cecil county. They have no other food than that which it affords.

Similar experiments to that made by Mr. Vaux, were made by myself, Dr. Harris, and several others. From Mr. Vaux most probably, not having been directed as to the mode of applying the friction, the butter was not obtained so rapidly, as in other instances. I saw it produced in less than ten seconds. The cows had been fed upon bran, what is generally called shorts at the Pennsylvania mills, (with twenty double bushels of which, two bushels of corn meal had been mixed), small portions of mangel wurtzel, and orchard grass† hay. The milk was drawn night and morning, simply deposited in pans, in a deep cold cellar, having been subjected to no other treatment than that of straining and skimming. It may be proper to observe that Mr. Powel jocosely remarked he did not flatter

* May 23d. † Cocks-foot.

himself, that this cream if amalgamated in a churn with the cream of other cows, would, like the Alderney cream, come first,* nor would he imply that all Short-horn cows are good milkers, nor that such EXTRAORDINARY properties are often to be found in the best tribes of the Improved Short-horns, but that they are better fitted for the general purposes of the country than any race with which he is acquainted, and that certain FAMILIES of *Improved Short-horns* are deep milkers.

He further remarked that it was not the value of a wool bearing, nor butter yielding brute, but the "SOUNDNESS OF HIS OPINIONS," he was anxious to establish, and that he firmly believes that there are various "native cattle," as they are called, of excellent properties, with which, (as

* *Extract of a Letter from Reuben Haines, Esq. of Germantown.*—"I have long been of the opinion, that in England particularly, the great breeding country, whence we derive our finest stock, too much attention was paid, and vast sums expended, in the vain endeavour to procure a race that shall excel in all the three great points of "the pail, the yoke, and the knife," as they are technically termed; and whilst other gentlemen were selecting the finest forms to feast the eye, and a carcass, which if well fed, would grow to an enormous size, I wanted a small animal, whose carcass was too valuable for beef,† that would subsist on a small quantity of food, bear the heat and drought of our summer and autumn, and produce the greatest quantity of rich and delicious butter, in proportion to the food consumed. * * * * * One remarkable property of the cream of the Alderney cow is, the readiness with which it is converted into butter. The week in which we kept it separate, "it came," as the phrase is, in five minutes; and in churning it, mixed with the cream of other cows, we usually have had the Alderney butter come first,‡ be taken out of the churn, and the operation continued half an hour or more before a second gathering of butter has taken place."—*Mem. Penn. Ag. Soc. pp. 20, 22.*

† If the carcass be too valuable for beef, how is it to be used?

‡ By what means could this be ascertained?—*En.*

Excellence of Half-Breeds.

I know,) he has made great efforts, and at no small expense, to have crosses by means of improved bulls.

JOHN P. MILNOR,
Rec. Sec. Penn. Ag. Soc.

Extract of a Letter from Colonel Lloyd.

Talbot County, (Maryland,) Wye House, May 3, 1825.

MY DEAR SIR,—Many of my half bred Champion heifers,* (now two years old,) have had calves this spring, and, contrary to my expectation, are 50 per cent. superior for milk to any breed I have ever had. They have had only the fare of the common cattle on my estate. All of the mixed blood are so much superior to my common stock, that I consider myself well paid for my purchase,† by the mixed blood alone which I have reared. My half blood young bull *which you admired*, is now a noble animal.

I have given my mixed Devons a fair trial with my mixed Short-horns, and it would be only necessary for the most prejudiced or sceptical to see them to decide in favour of the Short-horns. In size and form there is no comparison, and the Short-horns are vastly superior for milk.

Yours, truly,

EDWARD LLOYD.

JOHN HARE POWEL, ESQ.

* Champion, an improved Durham Short-horn bull.

† Col. Lloyd paid \$1500 for three Improved Short-horns, two years old.

Bucks County, February 2, 1825.

DEAR SIR,—It is now about three months since I purchased of you a cow and bull calf, since when, I have given great attention to them, in order to ascertain their value as compared with the common cattle of the country, and have come to the following conclusion:

The cow, considering her age, (3 years) and the food to which, at this season, she is necessarily restricted, is a deep milker—the most so of any animal in my possession—a small consumer, and easily kept fat, (surprisingly so, taking into view the quantity of milk yielded,) and is perfectly gentle and docile in her disposition.

The bull, without any extraordinary keep, is much larger than calves of his age, and in his form and appearance more resembles a grown steer than calves of his age (7 months). He keeps very fat upon a moderate allowance, and like the cow, is extremely docile. I feel perfectly satisfied that the Improved Short-horns will keep in fine order upon the same quantity of food which, when given to animals of three-fourths their weight, will not be found sufficient to produce the same effect. This I state from actual experiment, and consider the observation perfectly just, as applied not only to my own animals, but to the breed generally.

Quality of Butter.

My improved stock have been viewed by a number of my neighbours, and have been uniformly admired, and as you know, from my experience of their valuable properties, I have been induced to increase the number by additional purchases from among your very extraordinary stock.

JOHN HARE POWEL, Esq.

Cor. Sec'y Penn. Ag. Soc.

Extract of a letter from Henry A. Carpenter, Esq., an extensive practical farmer, in one of the most fertile, and best cultivated parts of Pennsylvania, to the Corresponding Secretary of the Pennsylvania Agricultural Society.

Lancaster County, June 14, 1823.

DEAR SIR,

The two half blood heifers by the Short-horn bull Denton, which you stated had calved last July, produced through the course of last winter, butter of a *better quality*, than any I ever saw made in the month of May, and it was always obtained in about ten minutes churning. One of these heifers produced a calf the beginning of June; the other (the three year old,) has supplied nine labouring men all spring with a sufficiency of milk, and butter once a day; which production exceeded that of *a fresh milch cow*

Milking and Feeding Properties.

of the common stock, which *I had selected with great care, and proved to be as good a milker as the neighbourhood could produce.* I am sorry that I cannot give you an account of the production of butter from the imported cow Moss Rose, in a given time, as her calf had got so old before the trial was made, that it would not take to other cows; but I do not hesitate to give it as my opinion, *that twelve or fifteen pounds of butter* of the finest quality, can be made from her in one week, as she possesses the power of secreting rich milk, in a greater degree than any animal I have ever seen. I expect that this is enough to satisfy you, that as milkers, the Durham Short-horns are not to be surpassed. The bulls are docile and quick feeders.

From Mr. Joseph Kersey.

Chester County, 2d Month 12th, 1825.

I purchased an half bred improved Durham Short-horn bull, which I sold at public vendue for one hundred dollars, and I am happy to learn that he has had, during the last season, near one hundred cows. His docility, his aptitude to fatten upon little provender, are admirable. I raised two of his calves, which, when four weeks old, were generally supposed to be two months old, from their being so remarkably fleshy and well grown, although they had not

received any thing but the milk from their dams. Robert Clemmens raised one from a cow that would not weigh more than three hundred pounds. He killed the calf at six months old, the meat of which weighed three hundred and thirty-four pounds, for which he obtained ten cents per pound.

There was a cow exhibited at the Paoli; her calf was, at that time, one year and three days old, and had been kept from her for one night, and the next morning I milked from her at least two gallons of beautiful rich milk, and owing to her not being accustomed to being milked, it was impossible to get it all from her.

Taking this breed in every point of view, I consider them better adapted to the use of farmers than any other breed I am acquainted with. They arrive at maturity early, feed quick, are good milkers, and are exceedingly kind and docile; they have more weight in the most important points, viz: the standing ribs, the sirloin, the rump, &c., and have much less offal than cattle in common. Take one of this breed, and another of the common kind, of equal weight; slaughter them and sell them at the different prices the different pieces command in the market, and it will be found that the Short-horn will return considerably the most money, merely be-

Improved Short-horns—Light Offal—Deep Milking.

cause it has more of the high priced pieces, and less offal.

I am, very truly, thy friend,

JOSEPH KERSEY.

JOHN P. MILNOR,

Rec. Sec'y Penn. Ag. Soc.

From David Comfort, of Philadelphia County.

RESPECTED FRIEND,—I have this morning seen the cow to which Joseph Kersey alludes in the foregoing letter. She has all the appearance of a deep milker. Her calf has been running at her side, I am assured, from its birth; it appears healthy and of good size; it sucked, I am assured, last night and this morning. The cow was also milked last night. She yielded this morning, in my presence, in addition to the consumption of the calf, a quantity of rich milk which I suppose to be equal to about eight quarts. My business is that of a practical farmer. I have therefore purchased her calf of the last year, at a large price, with a view of raising and improving *dairy cattle*. I think the other cows on the farm of the improved breed, have also the appearance of deep milkers.

DAVID COMFORT.

JOHN P. MILNOR,

Rec. Sec'y Penn. Ag. Soc.

Trial of Yearling Heifers.

From Charles A. Barnitz, Esq.

York, Penn., May 23d, 1825.

DEAR SIR,

Knowing the great interest you feel in all things relating to our stock of cattle, it gives me pleasure to inform you of the flattering prospects I have in the increasing excellence of the Improved Durham Short-horns, which were obtained last spring. Yorkshire was nine months, and Hebe fifteen months old, when they were procured; I have now had them one year, and their improvement in size and beauty surpasses every thing of the kind that has been known in this county. We have a rich valley, highly cultivated, extending through York county, and almost every farmer has one or two choice cows of the native stock, which he considers of a superior kind; but from all that I have seen in my own examination, (and I have taken pains in the matter,) as well from what I hear, they fall far short of Hebe in beauty, size, shape, and other points of value. Early last summer I obtained from a neighbouring farmer a beautiful heifer of the native stock, of the finest shape and promise, and of the same age with Hebe. I kept them together upon the same feed until new year, when the difference was so great, that allowing for a small original difference in size, Hebe appeared at least two years ahead in improvement.

Superiority of Improved Stock.

Yorkshire is an uncommonly fine animal, and although not two years old, has the weight and size of the best common bulls at five years old. The great breadth and perfect symmetry of his frame is most extraordinary; his skin is covered with a coat of hair almost as fine as fur, and his fine handling shows an elasticity, which in the course of another year will advance him to the first rank of fine animals.

Our farmers, who generally know the leading points of good stock, have formed the highest opinion of this breed, and all agree on the great importance of extending them as rapidly as possible.—The great difficulty of obtaining them, and the high prices they command, will for some years retard the progress of the full blood; but even the half blood, which almost every farmer may obtain, must make a sensible improvement in the course of two or three years.

The calves got by Yorkshire when he was only a year old, from common cows, indicate the great superiority of the breed in a remarkable degree. A heifer calf, got by him on a common cow, was lately sold for \$20, when common calves of the same age and best appearance, will not command five dollars.

I hope, my dear sir, your exertions to promote the improvement of our farm stocks, may be rewarded as well in value as in what I know to be much more gratifying to you, the satisfac-

Improved Short-horns—Quantity and Quality of Milk.

tion of contributing so largely to the substantial wealth and comfort of your fellow citizens.

I am, very respectfully,

Your obedient servant,

CHARLES A. BARNITZ.

JOHN HARE POWEL, Esq.

Extract from a communication, made by his Excellency Levi Lincoln, Governor of Massachusetts—President of the Worcester County Agricultural Society.

(Memoirs Pennsylvania Agricultural Society, p. 14.)

“Upon the subject of *Denton's* progeny, I should fear to write to any one less observing and sanguine than yourself. With nineteen of them, of different grades and ages, in my possession, I can safely say, that my most confident anticipations have been entirely answered. I have now seven heifers in milk, four of them 3 years, and three 2 years old, and for richness in quality and abundance in quantity, they are not excelled by the very best cows *of any age*, of the native stock. A heifer of 3 years, with her second calf, has not been dry since she dropped her first, having given four quarts on the morning of her second calving.

“Next to the Merino sheep, I consider the introduction of the Short-horns, *in the blood of*

Denton, as the richest acquisition to the country which agriculture has received. For the dairy and the stall I speak with the utmost confidence of their pre-eminence. From my three years old heifers I have calves of the most promising appearance, and greatly excelling any I have before seen. One of the heifers gives from 16 to 20 quarts of the richest milk, by the day, since calving; the other a little less, from the circumstance of having been in milk continually for more than a year; but her milk is in no degree inferior in quality. The last season she gave eleven quarts at a milking, with grass only, and this not unfrequently. They keep as easily as the native stock, and are as hardy. I have this year a three-fourths heifer calf from a half blood of *Denton* by *Admiral*, the famous bull sent out by Sir Isaac Coffin last year, to the Massachusetts Agricultural Society, and two others by the celebrated bull "*Cælebs*" on *Denton's* half blood. They are fine promising animals, although in no respect superior to the *three-fourths* of *Denton*. I have no knowledge of the properties of this stock for labour, never having altered but one of the males. I cannot, however, perceive any reason to doubt their value in this particular. Their form indicates great power, and they have much quietness and docility."

Half Breeds at six times the price of common Stock.

Washington, (Pa.) December 3d, 1825.

JOHN HARE POWEL, Esq.

Corresponding Secretary of the Pennsylvania Agricultural Society.

DEAR SIR,

I have seldom paid \$200 in a manner more to my satisfaction, than that paid for the young bull.* The object I had in purchasing was the improvement of my own stock. I am now perfectly satisfied that this will be accomplished equal to my most sanguine expectations; and I have the additional gratification of seeing my neighbours' stock also rapidly improving. You will probably recollect, that at the time I purchased, I attributed the fine appearance of your stock in some degree to *extraordinary keep*. The little experience I have had is calculated to do away this impression. I have sold every calf I could spare, to experienced farmers, from six to eight times the price of common calves; and reserved the best. Several of my next spring calves are already bespoke. Nonsuch took the highest premium at our exhibition of 1824—at our last show I entered all my stock for exhibition only, and not for premiums. The committee on cattle reported Nonsuch the finest animal they had seen. They noticed his calves in the same handsome manner. There were 12 of them on the ground. I herewith send you the printed report. * * * * No fact appears

* Nonsuch, a half bred Short-horn bull, by Denton.

to me more obvious than that the best possible mode that could be devised to call the attention of our farmers to the improvement of our native stock, is to exhibit amongst them the best specimens of what has been done in other countries. The estimation in which the "Improved Short-horns" are held by the practical men in England, without taking into view our own experience, ought at least to procure for them some indulgence until they have a fair trial. I am so thoroughly satisfied of their excellence, that I do not mean to stop until I have some of the pure blood. I forgot to tell you in its proper place, that my yearlings are easily kept in good order, and excel in those points that indicate deep milkers.

I am sincerely yours,

ALEXANDER REED.

Extract of a Letter from E. Wolcott, Esq., a skilful practical farmer.

East Windsor, Conn., June 17, 1825.

In January last, I journeyed to Vermont, and saw the descendants of the Holstein (Short Horns,) cattle, imported by Wm. Jarvis, Esq., about fourteen years ago. Satisfied of the excellence of this stock, I purchased of Mr. Jarvis a few heifers. In March, I travelled into Massachusetts, and saw the imported bulls Denton,

Improved Short-horns and Native Cattle compared.

Coelebs, and Admiral, of the Improved Durham Short-horn breed. and many of their progeny. Recently I have seen more of the same breed in your possession, and in Baltimore; and should think no lover of fine cattle could see them, without acknowledging their excellence.—How fully I am persuaded of their superiority over any other breed of neat cattle, you may well know by the price I paid for a young male of pure blood.

With sentiments of much respect and esteem,
I am, sir, your most obedient humble servant,

E. WOLCOTT.

JOHN HARE POWEL, ESQ.

Cor. Sec'y Penn. Ag. Soc.

Passyunk, Philadelphia County,

January 27th, 1825.

SIR,—In answer to your inquiries, I state that my father and myself keep generally one hundred milch cows. He has usually fed, annually, from four hundred to six hundred head of cattle; my business is exclusively that of a grazier and dairy farmer. I have had in my possession cows of various breeds, imported into Pennsylvania, and have seen some of the best milch cows purchased by order, in New England and New York State. In addition to my other employments, my business as superintendent of the District of Meadow at Schuylkill Point, leads me

constantly among the cattle grazed upon it. I have no hesitation in declaring, after a minute examination of the Improved Durham Short-horn cows at Powelton, that I have never seen any animals which I would prefer, as dairy stock. The position and shape of their udders, their thin necks and very small bone, together with their whole form, give as much appearance for milk, as any thing I have ever seen. I have often sold cows from sixty to eighty dollars, of the best breeds, which could be found before the late importations of Short-horns.

WILLIAM BRADLEY.

JOHN P. MILNOR,
Rec. Sec. Penn. Ag. Soc.

Extract from the Report of the Committee on Neat Cattle, at the Cattle Show at Worcester, Massachusetts, in 1825.

Governor Lincoln offered for exhibition three half Denton* cows, all of excellent quality, but one of them particularly noticed as an extraordinary animal of her kind. She has often given from 24 to 27 quarts of milk per day, of excellent quality, yielding a large proportion of cream. The least quantity of milk given by her in any one day during the summer drought, on grass feed only, was 13 quarts! The committee considered her THE MOST VALUABLE MILCH COW EVER EXHIBITED IN THE COMMONWEALTH.

* Denton, Mr. Williams' Improved Short-horned Bull.

Sheep—Merino—Characteristic Marks, &c.

*Sheep—Merino—On the necessity of attending to
Yolk—The characteristic marks and peculiarities
of the best varieties.*

BY JAMES CALDWELL, ESQ.

Philadelphia, October 2d, 1826.

MY DEAR SIR,—To the queries which you have done me the honour to address to me, I have no hesitation in answering *generally* in the affirmative, viz. I have generally found the finest fleeces to contain the most yolk. Yet I have known exceptions to this general rule, in sheep that appeared to have a peculiar secretion, and CONCRETION of the yolk; those exceptions, however, have been so rare, as to establish in my opinion the correctness of the general rule.

It is also, in my opinion, a characteristic of the Merino fleece to have an abundance of yolk.

* * * * *

I have no hesitation in saying, that all who have paid attention to the subject, must be aware of the fact, that an individual of an ordinary breed might accidentally be endowed with qualities superior to the generality of its race. A horse, for instance, might possess uncommon speed, but it would be imprudent to *breed* from such an animal for the purposes of the course, without the corroboration of *marks*, which good judges could not mistake, to ascertain with precision the stock to which it belonged.

* * * * *

I beg leave to present to you an engraving of one of my ewes, which, in my opinion, has all the characteristics of the best variety of the Merino.

Sheep—Merino—best varieties.

It must be perfectly well known to you, that *many varieties* of the Merino were imported from Spain. I have examined most of these importations, and found none equal in value, in my estimation, to the variety, of which this engraving shows the characteristic marks.

I would not have exchanged that ewe for the best Saxon Merino I have ever examined. You will observe *that the head is covered with wool down to the nostril*. Bare heads are apt to be accompanied by bare bellies and light fleeces.

* * * * *

With the greatest regard and respect,

Your obedient servant,

JAMES CALDWELL.

JOHN HARE POWEL, ESQ.

Corres. Sec'ry of the Penn. Agricul. Society.

Extracts from Dr. Parry's Essay on the Nature, Produce, Origin, and Extension of the Merino breed of Sheep.

"In the year 1765, Augustus Frederick, Elector of Saxony, introduced into his dominions from Spain 100 rams and 200 ewes, chosen from the most noted flocks. Part of these were established at the Electoral farm at Stolpen, on the frontiers of Bohemia, six leagues from Dresden. Three other secondary sheep farms were instituted, at Rennersdorf, Lohm, and Hohenstein, in order chiefly to improve the native breeds by the Spanish cross. At the end of ten years, these establishments were found to have had all possible success. The sheep of the pure blood had preserved every valuable quality, and the ultimate crosses had wool fully equal in fineness and beauty, to that of the pure Merinoes."

"According to Lasteyrie, the pure Merinoes belonging to the Elector, amounted in 1802, to 3400."

"The sheep of these flocks are larger or smaller, and yield more or less wool, according to the nourishment which is given them, and the mode in which they are treated. On the whole, they are smaller and less productive, than the original ones in Spain."

"The winter food of the Saxon Merinoes consists of hay, lattermath, clover, oat or rye straw, haulm of peas, vetches, lentils, &c. which are distributed twice or thrice a day, according to their quality. Some cultivators give oil cake, and bran or corn bruised, or ground into meal. They mix these articles in a tub with the water which they give the sheep to drink, and afterwards divide among them the more substantial sediment. This mixture, which they find singularly beneficial to the lambs, should be made with hot water; and seven or eight pounds of cake or meal are divided among 100 sheep."





SHEEP.

On various breeds—Teeswater—Dishley—and Southdown—their Characteristics—Form—Flesh—and Fleece. On early Maturity—Its Importance—Value not determined by great Size.

BY JOHN HARE POWEL, Esq.

Powelton, Feb. 20, 1827.

In a communication which I had the honour to present to the society, I remarked—The Teeswater sheep are the largest in Europe—are slow feeders—tallow well within—carry more flesh, and less fat without; but produce much worse mutton, and much coarser offal, than the Dishley breed. Their fleeces are heavy, and afford, in common with the Dishley, what is called combing wool, fitted for the manufacture of camlets, and various articles of worsted. The Southdown sheep are much smaller than the Dishley—they are more hardy—their wool is short, equal in quality to that of half-bred Merino—their fleeces are not so heavy—they carry more fat within, and much more flesh without, than either the Dishley, Tunisian, Irish, or Teeswater sheep. By their activity and vigour, both of muscle and constitution, they are fitted to encounter every difficulty, as well as to endure the extremes of heat and cold. They occupy, in England, one of the most exposed and least fertile portions of the island—their mutton is of the finest kind, and commands the highest price, although from the properties of the sheep it can be produced at least cost.

There is no mistake more prevalent, and none more egregious, than that which ascribes excellence to *great size*. Unless it be had early, and at comparatively small expense, large size does not more determine the extent of usefulness in the quadruped, than in the man. Weight is not always ascertained by size—It is affected more by compactness and squareness in certain parts, with rotundity of the barrel, than by mere extension of the frame. If the hind quarters be *long, deep, and wide*—the shoulders be *placed well back*—the *breast be ample*—the brisket be protruded—the back be broad—the *loins wide*—the *girth behind the fore legs and over the chine, be large*, the animal must possess not merely the frame which weighs most, but the form which carries most weight in the valuable parts, and affording sufficient room for the action of the lungs; without which, health and thrift can be seldom found.

Some animals have good forms, but are “*shelly*,” as it is technically termed, conveying the idea of the absence of the due quantity of flesh. Some breeds produce too much fat, in proportion to flesh: those which carry comparatively a large quantity of flesh, ‘marbled when ripe,’ with the propensity to become fat at an early age, and in the shortest time, are those best fitted for grazing purposes. These remarks apply to neat cattle as well as to sheep. It is evident that the product, whether in beef, mutton, butter, cheese, or milk, must be estimated by the *quantity of food*, before the result can be had. Early maturity not only saves food, but spares capital and gains time. The quantity and quality of the wool is a matter of serious importance, when the

Sheep—Yolk essential to fine Wool.

value of sheep is to be determined. I do not mean by quality, the fineness of the fibre alone, nor do I mean to confine the remark to sheep whose wool is of the finer sort. The filaments of combing wool should part readily—those of fine wool should be *soft and elastic*, as if it had been frizzled. The mere fineness of the fibre, or length of the staple, is not the only test of excellence: a diseased, or half starved sheep, produces fine wool, but not an elastic, nor useful material.

The sheep which produce the finest fleeces, are not *necessarily* the best to form a *breeding flock*. If their constitutions be not good—if *their forms* be bad, the secretion of yolk, which is essential for the support of the fleece, must be small; the offspring, consequently, will be a degenerate race. Thus, in selecting merinoes, regard should be given to their forms, even in those parts of the country where the demand for the carcass is so small, as to make mutton of little value.

It has been objected that the mutton of South-down sheep may be good—that its excellence, if it exist, must be ascribed to their extensive ranges of pasturage—that the ewes when four or five years old are almost invariably destitute of wool on their bellies—that they afford at that age about $1\frac{1}{2}$ pounds, that the wethers afford 2 to $2\frac{1}{2}$ pounds of wool—that they can be found in almost every flock of common sheep throughout a considerable portion of Pennsylvania and New Jersey—that their wool is not very visibly finer, and that their mutton from the same pasturage is not known to be better than that of common sheep.

The following notices will determine how far

Sheep—Southdowns—Fleece, its quality.

the assertions as to the hardness of the animal—the excellence of the flesh—the quantity and quality of the wool are established by the opinions of manufacturers, woolstaplers, graziers, and men of *taste*.

I have the honour to be, &c.

JOHN HARE POWEL.

To the President of the Pennsylvania Agricultural Society.

Southdown Sheep—On their Properties—Hardness—Tendency to become fat—On their Fleeces, close, heavy, and sufficiently fine for General Purposes—On their Flesh—Its delicacy—Flavour, and superiority to all other Mutton.

BY WILLIAM PHILLIPS, Esq.

Philadelphia, February 12th, 1827.

DEAR SIR,—Agreeably to your request, I give you my opinion of the Southdown sheep, exhibited to a committee of the Philadelphia Agricultural Society, of which I was a member. Although the fleece in fineness is not equal to Merino, yet I ascertained from dealers that a SMALL PART OF THE FLEECE WOULD MAKE GOOD BROAD-CLOTH, AND THE REMAINDER IS IN HIGH ESTIMATION FOR INFERIOR FABRICS. Considering all their estimable properties, I am of opinion that such Southdown sheep as you exhibited, are as valuable a stock, if not more so, than any other that have been kept in this country.

THE FLEECE IS CLOSE, HEAVY, AND SUFFICIENTLY FINE FOR GENERAL PURPOSES, AND A SMALL PART FINE ENOUGH FOR ANY PURPOSE to which wool is likely to be applied for many years to come.

Sheep—Southdowns—Mutton—Its excellence.

To the excellence of the Southdown mutton, I can with pleasure testify, as well as several gentlemen whose judgment of the luxuries of the table, will not be doubted by those who know them—They were so well pleased with it, that they cordially gave the annexed certificate of their opinion of the saddle of an imported wether, which was a present to Mr. David Lewis, who kept it upon his farm, ON COMMON PASTURE, WITHOUT GRAIN OR ANY PARTICULAR ATTENTION, and it was the finest saddle of mutton, in appearance, delicacy, and flavour, I ever saw or tasted. It was greatly admired by many others. Their thriving properties, and tendency to become fat, are very important recommendations.

I remain, with much esteem,

Yours,

WILLIAM PHILLIPS.

JOHN HARE POWEL, Esq.

We the subscribers having partaken of a saddle of mutton from Mr. David Lewis' farm, of the Southdown breed, the qualities of which are not generally known here, are of opinion that it is much superior in delicacy and flavour to any other mutton we have eaten.

WILLIAM PHILLIPS,
JOHN CLEMENTS STOCKER,
JOHN SMITH,
LAWRENCE LEWIS,
J. K. WUCHERER,
L. CLAPIER,
ANTHONY STOCKER,
ROBERT TOLAND.

Philadelphia, February 12, 1827.

Sheep—Southdowns—Form and Fleece.

*Southdown Sheep—On their Fleeces, Carcasses,
and fine Points.*

By JAMES SYKES, Esq.

(An extensive manufacturer of Maryland.)

Baltimore, October, 1826.

DEAR SIR,—In reply to your inquiries upon the subject of Southdown sheep, I take leave to state, that I carefully examined the Southdown sheep exhibited by Colonel Lloyd at the late Maryland cattle show, and have samples of wool, fairly taken from them, together with samples from Merino sheep, exhibited at the same time. I have no hesitation in giving, as my opinion, that the Southdown wool is equal in quality to the wool of the Merino sheep, shown upon that occasion (with the exception of the sheep exhibited by Wm. Patterson, Wm. R. Dickinson, Esquires, and General Mason) but, I would here remark, that I considered none of the sheep exhibited (except those owned by the aforementioned gentleman) full blood Merinoes, judging from the fleece.

I believe the Southdown wool shown me at Powelton, and the wool upon the Southdown sheep of Col. Lloyd, equal in quality to the general average of three-fourths blood Merino of this country, and superior to much wool offered for sale, as full blood Merino.

I consider the Southdown wool to be best adapted to the sattinett manufacture, the fleece being generally a close, short pile.

I think the Southdowns at Powelton possessed of remarkably good carcasses and fine points, and especially the ram last imported by you, which, in those respects, I think superior to any sheep I have ever seen.

Sheep—Southdowns adapted to general purposes.

I esteem the Southdowns a valuable race, taking into consideration both carcass and fleece, and, were I to engage in sheep husbandry upon the sea-board, where mutton is an object, should prefer them to any other kind I have yet seen; on the other hand, were I to keep sheep in the interior, where fleece would be my object, I should prefer the finest woolled Merino or Saxon, and would make my commencement from the flocks of Wm. R. Dickinson, Esq. of Ohio, as I am now of opinion he has sheep equal, if not superior, to the general race of Saxon sheep lately imported.

I am, with great respect,
Your obedient servant,
JAMES SYKES.

Southdown Sheep—Mr. Powel's Inquiries, addressed to Mr. Aaron Clement, one of the most successful breeders in the United States.

DEAR SIR,—You have bred sheep for many years—have travelled in various states—have manifested great zeal for the improvement of live stock—have been rewarded by the highest prices, and highest premiums for sheep of the mixed Dishley, Teeswater and Southdown race, and have aided me in procuring the very best animals of that variety. I thus rely especially upon your judgment and ask your replies* to the following questions.

JOHN HARE POWEL.

MR. AARON CLEMENT.

* Mr. Clement's replies and the subsequent certificates are adduced in refutation of the assertion, that Southdown sheep can be found in the common flocks of Pennsylvania, &c.

*Southdown Sheep—On their Characteristics—
their Forms, Points, Properties, and Vigour—
On the quality and close staple of their Fleeces.*

BY MR. AARON CLEMENT.

Have you ever seen such sheep as my imported Southdown sheep?

Ans. I have seen sheep, whose faces and legs have some resemblance to yours, but entirely different in form, yours being decidedly superior.

Do you think sheep so peculiar in form and appearance, could exist in Pennsylvania or New Jersey, without your having seen them?

Ans. I have never known any of the pure Southdowns to be in existence, in either of the above named states, with the exception of those said to have been imported by Captain Beanes into New Jersey, and they have been crossed with other breeds until they bear but little resemblance to the original stock.

Have these Southdown sheep close fleeces, covering well their bellies with wool of fine quality?

Ans. Your Southdowns are clothed with wool of fine quality, and close staple, their bellies well covered.

Have they good forms, with the appearance of vigour and hardiness.

Ans. Their form I think superior to most sheep that I have seen. They appear to be vigorous and hardy.

Have they wide chests, wide loins, heavy hind quarters, long frames, exhibiting a good carcass for a grazier?

Ans. They possess the above named fine points in a very eminent degree.

Very respectfully, yours,
AARON CLEMENT.

THE Art of Breeding.

On the adaptation of particular Breeds to the food, climate, and face of the country in which they are reared—The necessity of breeding in, to fix Varieties, or to establish Improved Breeds—The injurious effects of breeding in-and-in TOO CLOSELY.

BY JOHN HARE POWEL, ESQ.

Powelton, October 5, 1826.

DEAR SIR,—I have never considered any race of sheep fitted for all the climates, soils, and objects of our vast territory;* and I have endeavoured to show, that “particular breeds have been for ages retained in certain parts of Europe, where the shape of the animal has been made conformable to the purposes, to the climate, to the food, and face of the country upon which it has been reared. On the mountains of Scotland and Wales, on the bare chalk hills of the southern and western parts of England, races of sheep have always been bred, which, by the lightness of their carcasses, and the activity of their muscles, are enabled to find sustenance, and by the closeness of their fleeces, are fitted to endure the exposure, which, in mountainous regions, must always be met. In the rich vales of Leicestershire, and highly cultivated marshes of Lincolnshire, and other counties in the north, families, the very opposite to these, have been as carefully bred, possessing heavy carcasses, long wool, shorter legs, very small bone, with the most sluggish dispositions, without either the desire or the power to make exertion to obtain food.”

And with these impressions, you will perceive I have not given up long woolled sheep, but have repeatedly ordered them from England, in addition to several imported parcels, which I had obtained here, or in Massachusetts; more especially as I consider combing wool essential to certain manufactures about to be introduced.

* Memoirs of the Pennsylvania Agricultural Society, page 135.

Breeding—Varieties are fixed by breeding in.

My success in crossing Tunisian long woolled sheep with "BEANE'S MIXED" family of Dishley blood, was sufficiently manifest in the fine rams which you so much admired, on their way to my friends in Maryland and Virginia. In crossing these animals of different breeds, BUT NOT OF DISTINCT RACES, both being of THE LONG WOOLLED RACE, I did not expect to obtain the good qualities of both, *without the defects of either*; I but hoped to procure the hardiness and fine mutton of Tunisian sheep, and some of the attributes, not of pure Dishley, but merely of "Beanes' MIXED" FAMILY of Dishley blood. I expected from *mongrels* but the degree of excellence possessed by *mongrels*, until after a succession of years, by proper selection and repeated crosses, I might have fixed certain varieties in one family, constituting thus an improved breed.*

I might have pursued my object for many years, without danger of breeding too closely in, even if I had begun with but two sheep. It is admitted by most of the opponents of breeding in-and-in, that with certain views the father may be united with the daughter—with the granddaughter—g. granddaughter—and g. g. granddaughter; for the g. g. granddaughter is supposed to retain one-sixteenth of the blood of the original dam. But a brother and sister should very rarely be joined, as they are both of *precisely* the same blood.

Much confusion has arisen from the want of proper technical language to convey the principles upon which the art of breeding has been established. The use of the words, family, breed, and race, indiscriminately, causes no little difficulty in communicating precise impressions on this subject: and to prevent cavil in the use of terms, I will endeavour to illustrate the acceptation in which they are taken by me.

I have called all the old "Bakewell" sheep derived from Beanes' importation, "a mixed *family*," as they are mongrels, derived from his importation of Dishley, Teeswater, jumbled, in most cases, with Southdown, Irish, and common American sheep. The term family is used, to designate their close affinity in all cases; yet the absence of determined characteristics, denies to them the appellation of "a breed," which, I suppose, must be marked by points, properties, or general conformation so distinct, as to leave no hesitation in regard to immediate origin or descent.

But "race," I conceive, in the language of breeders, em-

* At the time this experiment was made, my attempts to procure sheep from England had been defeated by the penalties opposed to their exportation by the British statutes.

Breeding in—How far expedient.

braces many breeds; thus sheep are classed under the general terms, "long woolled and short woolled race."

By the term variety, I apprehend that breeders mean a product fortuitous, or the result of design, exhibiting peculiar characteristics, either in form or properties, or both, and which are so decided, as to prevent its being assigned to any known family, or particular breed.

* NEW VARIETIES ARE OBTAINED BY CROSSES—THEY ARE FIXED BY SELECTION, AND BREEDING IN. WHEN THEIR BLOOD HAS BEEN COMMIXED, AND THEIR OFFSPRING HAS BEEN JOINED DURING MANY GENERATIONS, WITH REFERENCE TO THE APPROXIMATION OF THE INDIVIDUALS SO JOINED TO THE POINTS OR PROPERTIES DESIRED, PRODUCING AN UNION OF THEIR CHARACTERISTIC PECULIARITIES, THEY ARE SAID TO BE ESTABLISHED OR FIXED IN ONE FAMILY, CONSTITUTING THUS AN IMPROVED BREED.

The first cross produces a variety called an half breed—the second, three-fourths—the third, seven-eighths—the fourth, fifteen-sixteenths, and so on. The variation of the blood in each cross is designated by figures to a certain point only, because there is a point where all sagacious breeders acknowledge, that the blood of the original sire or dam, is so nearly sunk or expelled, as to be little estimated, leaving them at that point, in possession of animals, usually equal to pure blood.

If it were not received among breeders, whose experience has led to the conclusion—if it were not sanctioned by men, whose habits of investigation, and general knowledge cannot fail to lead them to truth, it might be questioned whether an improved breed could be found, whose attributes could be retained without danger of some sudden transition, destructive of all the objects, in the promotion of which, it had been sought. This position may be illustrated by the success which the breeders of dogs, and even of birds, have attained.

The term "breeding in-and-in" appears to have been received by some writers in a different sense from that in which I apprehend it should be applied. I have considered Sir John Sebright's essay, published at the desire of the President of the Royal Society, decidedly the best which has appeared upon this subject; and in my impressions I am supported by Sinclair and Young, the one quoting Sebright in the "Code

* It will be recollected that this notice is intended for American husbandmen, who are not generally familiar with this subject.

Breeding in-and-in too closely—Effects.

of Agriculture," the other establishing his positions in the "Survey of Sussex," by giving the highest authorities—facts, as well as the opinions of practical men.

By opposing "breeding in-and-in," Sebright does not intend to exclude the union of animals nearly allied, for he justly remarks—

"Mr. Bakewell had certainly the merit of destroying the absurd prejudice which formerly prevailed against breeding from animals, between whom there was any degree of relationship; had this opinion been universally acted upon, no one could have been said to be possessed of a particular breed, good or bad; for the produce of one year would have been dissimilar to that of another, and we should have availed ourselves but little of an animal of superior merit, that we might have had the good fortune to possess."

And he continues, that brother and sister may even be joined with certain views, "should they BOTH BE VERY GOOD, and PARTICULARLY SHOULD THE SAME DEFECTS NOT PREDOMINATE IN BOTH, BUT THE PERFECTIONS OF THE ONE PROMISE TO CORRECT, IN THE PRODUCE, THE IMPERFECTIONS OF THE OTHER." Yet he opposes its being carried so far, *as some writers have imagined*, it was pursued by Bakewell, whose practice has never been traced.

I have contended that the effects of breeding CLOSELY in, are injurious; my practice, independent of any expression in favour of Sebright's doctrine, will determine that I do not object to the union, to a certain point, of animals nearly allied. One of my finest bulls (Malcolm) which I imported at the time I possessed many high-bred males of the same breed, is derived from a cow begotten by Western Comet, upon his g. g. granddaughter.

And that I am confirmed in this opinion by Mr. Coates, one of the oldest breeders of Great Britain, is evident in his declaring, that he has seen no bull which he would prefer to Malcolm as a sire.

The celebrated Knight, Mason, Rudd, Whitaker, Berry, and Sommerville, might be quoted in aid of that which has been advanced; but more pointedly to bring the soundness of Sebright's doctrine to your view, I would recal your own, and your brother's experience in flocks of sheep made decrepid by *too close* adherence to the same blood.

JOHN HARE POWELL.

To the President of the Pennsylvania Agricultural Society.

ON THE PRINCIPLES
OF
Improved Breeding.

(Extracted from Sinclair's Code of Agriculture, page 104.)

On the advantages of well-bred Stock—Breeding in—How far essential—Breeding in-and-in TOO CLOSELY, ruinous—Consequent decrease of size—Loss of characteristics—and procreative power.

“The art of breeding consists in making a careful selection of males and females, for the purpose of producing a stock, with fewer defects, and with greater properties than their parents, by which their mutual perfections shall be preserved, and their mutual faults corrected.*

“The objects of improved breeding, therefore, are, to obviate defects, and to acquire and to perpetuate desirable properties; hence, when a race of animals have possessed, in a great degree, through several generations, the properties which it is our object to obtain, and any tendency to produce

* Sir John S. Sebright's Essay on the Art of Improving the Breed of Domestic Animals, p. 5 and 8. All breeding proceeds on the presumption, that the tendency of any individual animal is, to transmit to its offspring, the form, constitution, and qualities which it possesses; and as two animals are concerned in the production of one offspring, that one is expected to inherit, a form and constitution, compounded on the joint qualities of its two parents. Thus it is found, in numerous breeds of animals, as in deer, in the West Highland Cattle, in the North Devon, and in the wild cattle of Chillingham Park: the offspring, for an indefinite number of generations, have borne the same general characters.—*Observations by C. Mason, Esq., of Clifton, co. Durham.*

Breeding in-and-in too closely—Effects.

unwished for properties, has been extirpated, their progeny are said to be *well-bred*, and their stock may be relied on.*

“It was upon this principle of selection, that Bakewell formed his celebrated stock of sheep, having spared no pains or expense, in obtaining the choicest individuals, from all the best kinds of long or combing woolled sheep, wherever they were to be met with;† and it cannot be doubted, that any breed may be improved in the same manner, namely, that of putting the best males to the finest females. After a superior breed, however, has thus been obtained, it is a point that has been much disputed, whether it is proper to raise stock, 1. From the same family; or, 2. From the same race, but of different families; or, 3. From races entirely different.

“1. *Breeding from the same family.*—This method is called breeding *in-and-in*, or putting animals of the nearest relationship together.‡ Though this plan was for some time in fashion, under the sanction of Bakewell’s authority, yet experience has now proved that it cannot be successfully persevered in. It may prove beneficial indeed, if not carried too far, in fixing any variety that may be thought valuable,§ but on the whole, it is so only in appearance. Under this system, the young animal comes into the world, on, comparatively, a very small scale. By keeping it fat from the first moment of its existence, it is made to attain a greater size than nature intended; and its weight in consequence will be very great in proportion to the size of its bones. Thus a generation or two of animals of an extraordinary form, and saleable at enormous prices, may be obtained; but that does not prove that the practice is eligible, if long persisted in.|| On the contrary, if the system be followed up, the stock get tender and delicate, they become bad feeders; and though they retain their shape and beauty, they will decrease in vigour and activity, will become lean and dwarfish, and ultimately incapable of continuing the race. The instances of this are

* Sir John S. Sebright’s Essay, p. 7. Incessant care and attention, however, are necessary, to keep them up to the mark; and this is rather fortunate than otherwise, since it perpetuates the *merit* of breeders, and the competition of stock.

† Young’s Lecture, p. 9.

‡ It having been found, that this system produced animals quite deficient in vigour, those who are now possessed of a capital stock, keep two or three *streams of blood*, quite distinct, that they may avoid a consanguinity.

§ Sir John S. Sebright’s Essay, p. 13. Paper by Henry Cline, Esq., Comm. vol. iv. p. 442.

|| Paper by T. A. Knight, Esq., Comm. to the Board of Agriculture, vol. ii. p. 185. These dwarfish males, however, may not have an injurious effect on the stock of another person, especially the first cross, if the females be of a coarser quality, and, on Mr. Cline’s principle, if they are of a larger size than the males put to them.

Breeding in-an-in—How far expedient.

numerous. The celebrated breeder, Prinsep, found, that decrease of size unavoidable, in spite of all his endeavours, by keeping his young stock well, to prevent it.* Sir John S. Sebright tried many experiments by breeding *in-and-in*, with dogs, fowls, and pigeons, and found the breeds uniformly degenerate.† A gentleman who tried the system with pigs, brought them at last into such a state, that the females gave over breeding almost entirely, and when they did breed, their produce was so small and delicate, that they died as soon as they were born. Nay, Mr. Knight's experiments with plants have fully convinced him, that in the vegetable, as well as in the animal kingdom, the offspring of a male and female, not related, will possess more strength and vigour, than where they are both of the same family.‡ This proves how unprofitable such connexions are. That is no reason, however, why a breeder may not manage a particular family of animals to great advantage, by shifting or changing, instead of breeding directly from parents to offspring.§ Hence the propriety of procuring males, from the flocks and herds of those who have the same or a similar breed. It has been remarked, that those farmers have in general the worst flocks, who breed from rams produced on their own farms, and that an interchange of males is mutually beneficial.||

“With respect to the doctrine, ‘that when you can no longer find better males than your own, then by all means breed from them, for that best can only beget best;’ it is ably refuted by an intelligent author, who has devoted much attention to the art of breeding. He observes, that there never did exist an animal without some defect in constitution, in form, or in some other essential quality; and such defect, however small it may be at first, will increase in every succeeding generation, and at last predominate in such a degree, as to render the breed of very little value.¶ Breeding *in-and-in*, therefore, would only tend to increase, and to perpetuate that defect, which might be eradicated, by a judicious selection, from a different family, in the same race.

* Paper by T. A. Knight, Esq., Comm. to the Board of Agriculture, vol. ii. p. 185.

† Sir John S. Sebright's Essay, p. 13.

‡ Paper by T. A. Knight, Esq., Comm. to the Board of Agriculture, vol. ii. p. 186.

§ Husbandry of Scotland, vol. ii. Appendix, p. 109. The same rule holds good regarding the human species. By a train of unfortunate circumstances, a brother and sister, german, ignorant of their close connexion together, were married. They had ten children, all of whom died before their parents.

|| Paper by T. A. Knight, Esq., Comm. vol. ii. p. 172.

¶ Sir John S. Sebright on Improving the Breeds of Domestic Animals, p. 11 and 14.

Crossing distinct races injudicious.

"2. The breeding from different families of the same race, is therefore a preferable system. When these have been for some time established in different situations, and have had some slight shades of difference impressed upon them, by the influence of different climates, soils, and treatment, it is found advantageous, to interchange the males, for the purpose of strengthening the excellencies and remedying the defects of each family. On this principle, the celebrated Culley continued, for many years, to hire his rams from Bakewell, at the very time that other breeders were paying him a liberal price for the use of his own; and the very same practice is followed by the most skilful breeders at present.

"3. Any attempt at improvement, *by crossing* two distinct breeds or races, one of which possesses the properties which it is wished to obtain, or is free from the defects which it is desirable to remove, requires a degree of judgment and perseverance, to render such a plan successful, as is very rarely to be met with. Indeed, though such crosses may, by great attention, answer at first, yet it is generally found, that great singularities attend such mixtures: and, in breeding bulls, though some of them may apparently do, yet their breed is not to be trusted."

ON IMPROVING THE BREED OF ANIMALS.

(Extracted from Loudon's *Encyclopædia of Agriculture*.—1826.)

By improvement of a breed is to be understood the producing such an alteration in shape or description, as shall render the animal better fitted for the labours he has to perform; better fitted for becoming fat; or for producing milk, wool, eggs, feathers, or particular qualities of these. The fundamental principle of this amelioration is the proper selection of parents. Two theories have obtained notice on this subject, the one in favour of breeding from individuals of the same parentage, called the *in-and-in* system, and the other in favour of breeding from individuals of two different offsprings, called the system of *cross breeding*. As is usual in such cases, neither theory is exclusively correct,* at least as far as respects agricultural improvement; for, as will afterwards appear, the principles on which a selection for breeding so as to improve the carcase of the animal depends, will lead occasionally to either mode.

* Sebright's positions are thus confirmed. See his remarks upon Mr. Meynel's breeding "from the father and the daughter and the mother and the son," and even "from brother and sister;" to which Sebright does not object, "if they should both be very good, and particularly should the same defects not predominate in both, but the perfections of the one promise to correct in the produce the imperfections of the other."—*Letter by Sir John Saunders Sebright, Bart., M. P., on the Art of Improving the Breeds of Domestic Animals.*

On Breeding—Misapprehension of Terms—Mr. Meynel's Practice—Breeding in-and-in—Crossing—Selection—Objects—Effects—Sebright's Theory—On fixing varieties—Sheep—Fleece—Form—Its influence upon the Constitution and Secretions of the Animal.

BY JOHN HARE POWEL, ESQ.

(In Reply to Major Rudd, of Marton Lodge, England.)

DEAR SIR,

On the degeneracy produced by breeding too closely *in-and-in*, I consider myself peculiarly fortunate in having your conclusive testimony. This fruitful subject of misapprehension had not till recently excited attention in this country among writers, although the evil tendency of following any stream of blood into too close affinity, has always been deprecated, and has been uniformly avoided, in the practice of successful husbandmen.

The subject is difficult, and the misuse of terms, or the want of precision, has in some instances been the source of discussion where little difference of opinion in fact prevailed.

In the language of Sebright, on various occasions, "I have freely stated my opinions without considering them as conclusive," and I venture to give the arguments which I have adduced in support of his essay, in order that I may be corrected by *you*, if I be wrong.

I apprehend, that his theory is founded upon the belief, that all domesticated animals are disposed "*to go back*," as having some tendency towards constitutional defects; and inferring that those of the same family are likely to be affected by tendency towards the same point, he thinks,

that by the union of animals so situated, and having *such tendency*, the defects will in the offspring be increased.

If he had defined his acceptation of the terms "*crossing*," and "*breeding in-and-in*," less difficulty might have prevailed. It is evident that the *common* application of these terms is very different from that in which I conceive them to be *correctly* used by him. He observes—

"Mr. Meynel's fox-hounds are likewise quoted as an instance of the success of this practice; but upon speaking to that gentleman upon the subject, I found that he did not attach the meaning that I do, to the term *in-and-in*. He said he frequently bred from the father and the daughter, and the mother and the son. This is not what I consider breeding *in-and-in*; for the daughter is only half of the same blood as the father, and will probably partake, in a great degree, of the properties of the mother."

"Mr. Meynel sometimes bred from brother and sister: this is certainly what may be called *a little close*; but should they both be very good, and particularly should the same defects not predominate in both, but the perfections of the one, promise to correct in the produce the imperfections of the other, I do not think it objectionable: much further than this, the system of breeding from the same family, cannot, in my opinion, be pursued with safety." * * * *

"Although I believe the occasional intermixture of different families to be necessary, I do not, by any means, approve of mixing two distinct breeds, with the view of uniting the valuable properties of both: this experiment has been frequently tried by others as well as by myself, but has I believe never succeeded. The first cross frequently produces a tolerable animal, but it is a breed that cannot be continued."^{*}

"If it were possible, by a cross between the New Leicestershire and Merino breeds of sheep, to produce an animal uniting the excellencies of both, that is, the carcase of the one, with the fleece of the other, even such an animal, so produced, would be of little value to the breeder;† a race of the *same* description could not be perpetuated; and no dependance could be placed upon the produce of such animals; they would be mongrels, some like the New Leicester, some like the Merino, and most of them with the faults of both."

* Should not the product of the *first* cross be called a *variety*?

† Should not the term *breed* be used?

Sebright asserts, as we all know, that varieties even of pigeons are established by selection and breeding in-and-in. The first cross produces an animal called an half-bred—the second, three-fourths—the third, seven-eighths—the fourth, fifteen-sixteenths, and so on. Of consequence, the variety obtained by *the first cross* could not be perpetuated, as the proportions of blood would annually vary, producing new varieties; which, after a long time and great vigilance in selection, might be established, constituting that which is technically called “an improved breed.”

It cannot be denied, that the offspring of a male and female, of precisely the same degree of affinity to two *distinct* breeds, would not generally exhibit precisely the same characteristics, nor would they show precisely those of the sire and dam. In some, the attributes of one of the breeds would predominate, whilst in many, those of the other would in different degrees most probably appear.

Do we not find facts, corroborative of this, in the human family? But when the most desirable points and properties have, throughout many generations, been determined by the skill of the breeder in selecting the animals, which most nearly approximate the excellence which he seeks—in uniting those whose union would, by “the perfections of the one promise to correct in the produce the imperfections of the other,” “a new variety is fixed.”

The Leicester sheep has long and coarse wool, with an open fleece—the Merino has short and fine wool, with a close fleece; the properties, points, and general conformation of these animals, are opposed as much as those of any

beings, of the same species, with which we are acquainted.

The product of the first cross, between a Merino and New Leicester sheep, would be covered, probably, with wool of medium texture; but when carried farther, it might become too short for combing, too long for the general manufactures of the country.

Sebright does not approve of crossing "*distinct* races," and gives an instance to show, what he means by *distinct* races. It is evident that the term race, is not always used in the same sense, nor should I have used it as he has done. The quadruped race embraces all animals having four legs, yet we find the term race applied frequently to a variety of a particular species; the improved Leicester sheep are called New Leicester, or the Dishley race.

It is evident, Sebright did not object to mixing animals of races, which he does not qualify by the term *distinct*; as he asserts, that Merino rams are frequently put to Southdown and Ryeland ewes, *all being of the fine woolled race*, which he approves *with certain views*. Nor would he object to uniting the Arabian with the turf horse—he knows that the best turf horses had been so produced; but he would oppose the union of a Welsh pony with a draught horse, or an Arabian courser with a Suffolk punch, if he desired animals either for the turf or the road. He is aware that varieties, sometimes fortuitous, sometimes the product of design, afford the means of establishing improved breeds of animals, or of meliorating cultivated fruits. He urges—

“The effect of *breeding in-and-in* may be accelerated or retarded by selection, particularly in those animals who pro-

Breeding—Effects of Climate and Food.

duce many young ones at a time. There may be families so nearly perfect, as to go through several generations, without sustaining much injury from having been bred *in-and-in*; but a good judge would, upon examination, point out by what they must ultimately fail, as a mechanic would discover the weakest part of a machine before it gave way.

“Breeding *in-and-in* will, of course, have the same effect in strengthening the good as the bad properties, and may be beneficial, if not carried *too far, particularly in fixing any variety* which may be thought valuable.”*

“I have tried many experiments by breeding *in-and-in* upon dogs, fowls, and pigeons: the dogs became from strong spaniels, weak and diminutive lap dogs, the fowls became long in the legs, small in the body, and bad breeders.”

He justly remarks—

“Many causes combine to prevent animals, in a state of nature, from degenerating; they are perpetually intermixing, and therefore do not feel the bad effects of breeding *in-and-in*: the perfections of some correct the imperfections of others, and they go on without any material alteration, except what arises from the effects of food and climate.

“The greatest number of females will, of course, fall to the share of the most vigorous males; and the strongest individuals of both sexes, by driving away the weakest, will enjoy the best food, and the most favourable situations, for themselves and for their offspring.

“A severe winter, or a scarcity of food, by destroying the weak and the unhealthy, has all the good effects of the most skilful selection. In cold and barren countries no animals can live to the age of maturity, but those who have strong constitutions; the weak and the unhealthy do not live to propagate their infirmities, as is too often the case with our domestic animals. To this I attribute the peculiar hardiness of the horses, cattle, and sheep, bred in mountainous countries, more than to their having been inured to the severity of the climate; for our domestic animals do not become more hardy by being exposed, when young, to cold and hunger: animals so treated will not, when arrived at the age of maturity, endure so much hardship as those who have been better kept in their infant state.

“If one male, and one female only, of a valuable breed, could be obtained, the offspring should be separated, and placed in situations as dissimilar as possible; for animals kept together are all subjected to the effects of the same climate,

* Here the evil tendency must be corrected by the breeder's skill in “selection.”

Breeding—Form indicative of Properties.

of the same food, and of the same mode of treatment, and consequently to the same diseases, particularly to such as are infectious, which must accelerate the bad effects of breeding *in-and-in*."

His observations upon sheep entirely agree with those which I had made in England as well as here. He continues—

"IN COMPARING THE MERINO SHEEP WITH THE SOUTHDOWNS, WHICH ARE ALLOWED TO BE THE BEST OF OUR SHORT-WOOLLED BREEDS, THE FORMER HAVE VERY MUCH THE ADVANTAGE, BOTH AS TO QUANTITY AND QUALITY OF WOOL; BUT, I BELIEVE, THE LATTER WOULD PRODUCE BY FAR THE GREATEST QUANTITY OF MEAT, FROM A GIVEN QUANTITY OF FOOD, WHICH IS THE CRITERION BY WHICH WE DETERMINE THE RELATIVE VALUE OF ALL ANIMALS AS GRAZIER'S STOCK.

"Taking the gross produce, both of wool and of carcase, at the present prices, the Merino breed may perhaps be the most profitable: but should it be generally introduced, fine wool would become cheaper, and mutton dearer; it is therefore not easy to form a conclusive opinion upon this subject.

"Great improvements may undoubtedly be made in the Merino breed, as to their disposition to get fat. Their advocates say, with truth, that the Southdown sheep were but a few years ago as imperfect in shape as the Merino now are; but they should recollect, that a disposition to fatten at an early age was always the characteristic of the Southdown breed, even in its most unimproved state, and that it was from its possessing this very essential quality that so much attention has been paid to it.

"It is well known that a particular formation generally indicates a disposition to get fat, in all sorts of animals; but this rule is not universal, for we sometimes see animals of the most approved forms, who are *slow feeders*, and whose flesh is of a bad quality, which the graziers easily ascertain by the *touch*. The disposition to get fat is more generally found in some breeds than in others. The Scotch Highland cattle are remarkable for being almost all *quick feeders*, although many of them are defective in shape. The Welsh cattle have but little disposition to get fat: not from being particularly ill-shaped, but because they are almost invariably what the graziers call *bad handlers*.

"We must not therefore suppose, that the bad shape of the

Breeding—Yolk essential to fine Wool.

Merino sheep is the sole cause of its being so ill calculated for the purpose of the grazier.

“An observation which Dr. Genner made to me about ten years ago, (the truth of which has since been confirmed by my own experience—that no animal whose chest was narrow could easily be made fat,) applies particularly to the Merino sheep, who are in general contracted in that part, and is well worth the attention of those who wish to improve this breed.

“PERHAPS THE GREAT SECRETION OF YOLK, SO ESSENTIAL TO THE PRODUCTION OF FINE WOOL, AND WHICH IS EXCESSIVE IN THE MERINO SHEEP, MAY BE INCOMPATIBLE WITH THE FATTENING QUALITY.

“I HAVE ALWAYS FOUND THE FINENESS OF THE FLEECE IN EXACT PROPORTION TO THE QUANTITY OF YOLK IT CONTAINED. THOSE WHO ARE UNACCUSTOMED TO EXAMINE WOOL, MAY CONSIDER THIS AS A CERTAIN CRITERION OF ITS QUALITY: FOR ALTHOUGH THE HAIR OF SOME DRY FLEECES MAY BE FINE, IT WILL ALWAYS WANT THE ELASTICITY WHICH IS SO MUCH VALUED BY THE MANUFACTURER.”

* * * * *

“The fineness of the fleece, like every other property in animals of all kinds, may be improved by selection in breeding. The opinion, that good wool could only be produced in particular districts, is a prejudice which fortunately no longer exists.

“Climate, food, and soil, have certainly some effect upon the quality of wool, but not so much as is generally supposed. The fleece is affected by the degree of nourishment which the animal receives, not by the quality of the pasture on which it is fed. If sheep are highly kept, their wool will become less fine, but in other respects its quality will not be deteriorated. The wool of a starved sheep may be apparently fine, but it will be brittle, and of little value to the manufacturer.

“A regular supply of food to the sheep is essential to the growth of good wool; for that part of the hair which grows when the animal is in a high state of flesh, will be thick, and that which is grown when it is reduced by hunger, will be weak and thin; and consequently the thickness of hair will always be irregular, if the animal passes from one extreme to the other.

“The alteration which may be made in any breed of animals by selection, can hardly be conceived by those who have not paid some attention to this subject; they attribute every

improvement to a cross, when it is merely the effect of judicious selection.

"I have often been told, that from the beautiful shape of Mr. Elman's Southdown sheep, they must have been crossed with the New Leicester; and that from the fineness of their wool, they must have been crossed with the Merino breed; but I do not conceive, that even the skill of this very distinguished breeder could have retained the good shape of the former, without any appearance of the coarseness of its wool, or the fine fleece of the latter, without the deformity of its carcase, had he crossed his flock with either of these breeds.

"It may as well be contended, that the white pheasant, which is now become very common, was produced from a cross with a Dorking fowl, whereas it was one of those accidental varieties, which sometimes occur, and which has been perpetuated by selection. The same may be said of the endless variety in the colour, shape, and size, of rabbits, ducks, and pigeons, in a domesticated state; a variety produced by the art of man, and which did not exist in these creatures in their natural state.

"A greater proof, I conceive, of what may be effected by selection and perseverance, cannot be adduced.

"There is, perhaps, no means by which the breeds of animals can be so rapidly, and so effectually improved, as by its being the particular business of some breeders to provide male animals for the purpose of letting for hire. Our horses could never have arrived at the degree of perfection which they have now attained, but from the facility which has been afforded to every one, by the public stallions, of breeding from the best horses of every description, at a moderate expense.

"The breeds of sheep to which this practice has been applied, have attained great perfection, while those which have never been attended to by persons in this particular business, show no signs of improvement.

"No trouble or expense will be spared by those who expect to derive profit, not from the quantity, but from the quality of the animals which they breed. The competition, which must always exist between breeders of this description, will be a never-failing stimulus to exertion.

"The common farmer, who seldom sees any stock but his own and that of his neighbours, generally concludes, that his own have arrived at the summit of perfection: but the breeder who lets for hire, must frequently submit his male animals to the inspection of the public, and to the criticism of his rivals, who will certainly not encourage any prejudices he may entertain of their superiority."

Breeding—Sebright supported by facts.

In illustration of Sebright's positions, various authorities might be adduced; but I consider the successful practice of Messrs. Colling, Charge, Maynard, Bates, Mason, Coates, Whitaker and yourself, affords the most decided evidence of the validity of his assertions, triumphantly sustained by the records of the Herd and Stud Books, wherein it will be found, that the best individuals have been the result of occasional and *judicious* crosses, and that the most valuable varieties have been established by skilful selection, and breeding in-and-in to a *limited extent*.

I am, my dear sir, with great respect,

Most truly yours,

JOHN HARE POWEL.

Extracts from Loudon's Encyclopædia of Agriculture.

That *the breed of animals is improved by the largest males*, is a very general opinion; but this opinion is the reverse of the truth, and has done considerable mischief. The great object of breeding, by whatever mode, is the improvement of form, and experience has proved that crossing has only succeeded in an eminent degree, in those instances in which the females were larger than in the usual proportion of females to males; and that it has generally failed where the males were disproportionally large. *Culley's Introduction, &c.* The following epitome of the science of breeding, is by the late eminent surgeon, Henry Cline, who practised it extensively on his own farm at Southgate.

The external form of domestic animals has been much studied, and the proportions are well ascertained. But the external form is an indication only of internal structure. The principles of improving it must, therefore, be founded on a knowledge of the structure and use of internal parts.

The lungs are of the first importance. It is on their size and soundness that the strength and health of animals principally depend. The power of converting food into nourishment, is in proportion to their size. An animal with large lungs is capable of converting a given quantity of food into more nourishment than one with smaller lungs; and therefore has a greater aptitude to fatten.

The chest, according to its external form and size, indicates the size of the lungs. The form of the chest should approach to the figure of a cone, having its apex situated between the shoulders, and its base towards the loins. Its capacity depends on its form more than on the extent of its circumference; for where the girth is equal in two animals, one may have much larger lungs than the other. A circle contains more than an ellipsis of equal circumference; and in proportion as the ellipsis deviates from the circle it contains less. A deep chest, therefore, is not capacious; unless it is proportionably broad.

The pelvis is the cavity formed by the junction of the haunch bones with

Breeding—Form how improved.

the bone of the rump. It is essential that this cavity should be large in the female, that she may be enabled to bring forth her young with less difficulty. When this cavity is small, the life of the mother and her offspring is endangered. The size of the pelvis is chiefly indicated by the width of the hips, and the breadth of the twist, which is the space between the thighs. The breadth of the loins is always in proportion to that of the chest and pelvis.

The head should be small, by which the birth is facilitated. Its smallness affords other advantages, and generally indicates that the animal is of a good breed. Horns are useless to domestic animals, and they are often a cause of accidents. It is not difficult to breed animals without them. The breeders of horned cattle and horned sheep, sustain a loss more extensive than they may conceive; for it is not the horns alone, but also much bone in the skulls of such animals to support their horns, for which the butcher pays nothing; and besides this there is an additional quantity of ligament and muscle in the neck, which is of small value. The skull of a ram with its horns, weighed five times more than a skull which was hornless. Both these skulls were taken from sheep of the same age, each being four years old. The great difference in weight depended chiefly on the horns, for the lower jaws were nearly equal; one weighing seven ounces and the other six ounces and three-quarters, which proves that the natural size of the head was the same in both, independent of the horns and the thickness of bone which supports them. In horned animals the skull is extremely thick. In a hornless animal it is much thinner, especially in that part where the horns usually grow. To those who have reflected on the subject, it may appear of little consequence whether sheep and cattle have horns; but on a moderate calculation it will be found, that the loss in farming stock, and also in the diminution of animal food, is very considerable, from the productions of horns and their appendages. A mode of breeding which would prevent the production of these, would afford a considerable profit in an increase of meat, wool, and other valuable parts.

The length of the neck should be proportioned to the height of the animal, that it may collect its food with ease.

The muscles, and the tendons which are their appendages, should be large; by which an animal is enabled to travel with greater facility.

The bones, when large, are commonly considered an indication of strength; but strength does not depend on the size of the bones, but on that of the muscles. Many animals with large bones are weak, their muscles being small. Animals that have been imperfectly nourished during growth, have their bones disproportionately large. If such deficiency of nourishment originated from a constitutional defect, which is the most frequent cause, they remain weak during life. Large bones, therefore, generally indicate an imperfection in the organs of nutrition.

To obtain the most improved form, the two modes of breeding described as the in-and-in and crossing modes, have been practised. The first mode may be the better practice, when a particular variety approaches perfection in form; especially for those who may not be acquainted with the principles on which improvement depends. When the male is much larger than the female, the offspring is generally of an imperfect form. If the female be proportionately larger than the male, the offspring is of an improved form. For instance, if a well formed large ram be put to ewes proportionately smaller, the lambs will not be so well shaped as their parents; but if a small ram be put to larger ewes, the lambs will be of an improved form. The proper method of improving the form of animals consists in selecting a well formed female, proportionately larger than the male. The improvement depends on this principle, that the power of the female to supply her offspring with nourishment, is in proportion to her size, and to the power of nourishing herself from the excellence of her constitution. The size of the fœtus is generally in proportion to that of the male parent; and therefore, when the female parent is disproportionately small, the quantity of nourishment is deficient, and her offspring has all the disproportions of a starveling. But when the female, from her size and good constitution, is more than adequate to the nourishment of a fœtus of a smaller male than herself, the growth must be proportionately greater. The larger female has also a larger quantity of milk, and her offspring is more abundantly supplied with nourishment after birth.

Breeding—Good effects of crossing.

Abundant nourishment is necessary to produce the most perfect formed animal, from the earliest period of its existence until its growth is complete. As already observed, the power to prepare the greatest quantity of nourishment from a given quantity of food, depends principally on the magnitude of the lungs, to which the organs of digestion are subservient. To obtain animals with large lungs, crossing is the most expeditious method; because well formed females may be selected from a variety of large size, to be put to a well formed male of a variety that is rather smaller. By such a mode of crossing, the lungs and heart become proportionately larger, in consequence of a peculiarity in the circulation of the fœtus, which causes a larger proportion of the blood, under such circumstances, to be distributed to the lungs than to the other parts of the body; and as the shape and size of the chest depend upon that of the lungs, hence arises that remarkably large chest, which is produced by crossing with females that are larger than the males. The practice, according to this principle of improvement, however, ought to be limited; for it may be carried to such an extent, that the bulk of the body might be so disproportioned to the size of the limbs as to prevent the animal from moving with sufficient facility. In animals, where activity is required, this practice should not be extended so far as in those which are intended for the food of man. * * * *

Examples of the good effects of crossing may be found in the improved breeds of horses and swine in England. The great improvement of the breed of horses arose from crossing with the diminutive stallions, Barbs and Arabians; and the introduction of Flanders mares into this country was the source of improvement in the breed of cart horses. The form of the swine has been greatly improved, by crossing with the small Chinese boar.

The pliancy of the animal economy is such, that an animal will gradually accommodate itself to great vicissitudes in climate, and alterations in food; and by degrees undergo great changes in constitution; but these changes can be effected only by degrees, and may often require a great number of successive generations for their accomplishment. It may be proper to improve the form of a native race, but at the same time it may be very injudicious to attempt to enlarge their size; for the size of animals is commonly adapted to the soil and climate which they inhabit. Where produce is nutritive and abundant, the animals are large, having grown proportionally to the quantity of food which, for generations, they have been accustomed to obtain. * * *

The Arabian horses are, in general, the most perfect in the world; which probably has arisen from great care in selection, and also from being unmixed with any variety of the same species; the males, therefore, have never been disproportioned in size to the females.

The native horses of India are small, but well proportioned, and good of their kind. With the intention of increasing their size, the India Company have adopted a plan of sending large stallions to India. If these stallions should be extensively used, a disproportioned race must be the result, and a valuable breed of horses may be irretrievably spoiled.

From theory, from practice, and from extensive observation, the last more to be depended on than either, "it is reasonable," Cline continues, "to form this conclusion: it is wrong to enlarge a native breed of animals, for in proportion to their increase of size, they become worse in form, less hardy, and more liable to disease." (*Communications to the B. of Ag.* vol. iv. p. 446.)

The above opinions may be considered as supported by the most eminent practical breeders, as Bakewell, Culley, Somerville, Parry, and others, and by most theorists, as Coventry, Darwin, Hunt, Young, &c. T. A. Knight writes in the *Communications* to the Board of Agriculture in favour of cross breeding, as do Pitt and others in the County Surveys, but mostly from very limited experience. * * * *

Of the general Principles of Rearing, Managing, and Feeding Domestic Animals.

After the birth, the first interference on the part of man should be that of supplying the mother with food of a light and delicate quality, compared to

Rearing—Food—Air—Exercise, &c.

that which she had been in the habit of using, and also of administering the same description of food to the offspring, so far as it may by its nature be able to use it. The gentlest treatment should accompany these operations; and the opportunity taken of familiarizing both parent and offspring with man, by gently caressing them, or at least, by familiar treatment on the part of the attendant.

As the animals increase in size and strength, they should have abundance of air, exercise, and food, according to their natures; and whatever is attempted by man in the way of taming or teaching should be conducted on mild and conciliating principles, rather than on those of harshness and compulsion.

Food, though it must be supplied in abundance, ought not to be given to satiety. Intervals of resting and exercise must be allowed according to circumstances. Even animals grazing on a rich pasture have been found to feed faster when removed from it once a day, and either folded or put in an inferior pasture for two or three hours. Stall-fed cattle and swine will have their flesh improved in flavour by being turned out into a yard or field once a day; and many find that they feed better, and produce better flavoured meat when kept loose under warm sheds or hammels, one or two in a division, a practice now very general in Berwickshire. In general it may be observed, that if the digestive powers of the animal are in a sound state, the more food he eats, the sooner will the desired result be obtained; a very moderate quantity beyond sufficiency constitutes abundance; but by withholding this additional quantity, an animal, especially if young, may go on eating for several years, without ever attaining to fatness.

In young growing animals, the powers of digestion are so great, that they require less rich food than such as are of mature age; for the same reason also they require more exercise. If rich food is supplied in liberal quantities, and exercise withheld, diseases are generated, the first of which may be excessive fatness. Common sense will suggest the propriety of preferring a medium course between very rich and very poor nutriment.

Salt, it appears, from various experiments, may be advantageously given to most animals, in very small quantities; it acts as a whet to the appetite, promotes the secretion of bile, and, in general, is favourable to health and activity. In this way only can it be considered as preventing or curing diseases; unless perhaps in the case of worms, to which all saline and bitter substances are known to be injurious.

Where a sufficient degree of warmth to promote the ordinary circulation of the blood is not produced by the natural climate, or by exercise, it must be supplied by an artificial climate. Houses and sheds are the obvious resources both for this purpose, and for protection from extremes of weather. Cold rains and northerly winds are highly injurious, by depriving the external surface of the body of caloric more rapidly than it can be supplied from within by respiration, and the action of the stomach; and also by contracting the pores of the skin, so as to impede circulation. When an animal happens to shed its covering, whether of hair, wool, or feathers, at such inclement seasons, the effects on its general health are highly injurious. The excessive heats of summer, by expanding all the parts of the animal frame, occasions a degree of lassitude, and want of energy even in the stomach and intestines; and while the animal eats and digests less food than usual, a greater waste than usual takes place by perspiration. Nature has provided trees, rocks, caverns, hills and waters, to moderate these extremes of heat and weather, and man imitates them by hovels, sheds, and other buildings, according to particular circumstances.

Good air and water it may seem unnecessary to insist on; but cattle and horses, and even poultry pent up in close buildings, where there are no facilities for a change of the atmosphere, often suffer on this account. A slight degree of fever is produced at first, and after a time, when the habit of the animal becomes reconciled to such a state, a retarded circulation, and general decay or diminution of the vital energies takes place.

Rearing—Cleanliness—Comfort, &c.

Moderate exercise ought not to be dispensed with, where the flavour of animal produce is any object; it is known to promote circulation, perspiration, and digestion, and by consequence to invigorate the appetite. Care must be taken, however, not to carry exercise to that point where it becomes a labour instead of a recreation. In some cases, as in feeding swine and poultry, fatness is hastened by promoting sleep and preventing motion, rather than encouraging it; but such animals cannot be considered healthy fed; in fact their fatness is most commonly the result of disease.

Tranquillity is an obvious requisite, for where the passions of brutes are called into action, by whatever means, their influence on their bodies is often as great as in the human species. Hence the use of castration, complete or partial separation, shading from too much light, protection from insects, dogs, and other annoying animals, and from the too frequent intrusion of man.

Cleanliness is favourable to health, by promoting perspiration and circulation. Animals in a wild state attend to this part of their economy themselves; but in proportion as they are cultivated, or brought under the control of man, this becomes out of their power; and to insure their subserviency to his wishes, man must supply by art this as well as other parts of culture. Combing and brushing stall-fed cattle and cows is known to contribute materially to health; though washing sheep with a view to cleaning the wool often has a contrary effect from the length of time the wool requires to dry. * * * * *

Comfort. An animal may be well fed, lodged, and cleaned, without being comfortable in every respect; and in brutes, as well as men, want of comfort operates on the digestive powers. If the surface of a stall in which an ox, or a horse stands, deviates much from a level, he will be continually uneasy; and he will be uneasy during night, if its surface is rough, or if a proper bed of litter is not prepared every evening for it to repose on. The form of racks and mangers is often less commodious than it might be. A hay rack which projects forward is bad; because the animal in drawing out the hay is teased with the hay seeds falling in its eyes or ears; and this form, it may be added, is apt to cause the breath of the animal to ascend through its food, which must after a time render it nauseous. For this reason hay should lie as short a time as possible in lofts, but when practicable be given direct from the rick.

Extract from the Memoirs of the Pennsylvania Agricultural Society.

The tendency towards fat proceeds, I should presume, from the power of the animal's stomach and intestines, to separate the nutritious from the excrementitious parts of its aliment. Nature wisely destines certain portions of nutritious matter, at proper times, for the secretion of milk. That milk is an unctuous and very nutritious fluid, cannot be questioned—much therefore of nutrition, is withdrawn by the milk, from the formation of fat—but does it follow, that such portions as have made butter, or *produced fat* in the calf, when no longer directed towards the secretion of milk, must necessarily lose all their properties and pass off in urine or in dung? Do we not invariably find, that all cows, when dry, become more readily fat, than when they give milk? Is it not then to be inferred, that the matter, which would have passed off in milk, may be made to produce fat? Does not our experience show, in all families of wild cattle, where the perverseness of man has not interfered with the dispositions of nature, that when kept quiet, and well fed, they exhibit great tendency towards the secretion of fat? In the cattle even of Asia, and China, in the Kyles of Scotland, in the wild breeds of Louisiana, and in the little mountain cows of America, such disposition is generally shown.

The mistaken ingenuity of the breeders of Holland, whence all the deepest milkers, whether *HOLDERNESSE*, "*OLD Short Horns*," *Holstein*, or whatever they may be termed in America, are in some measure derived, led them into an absurd cross, which produced unthrifty animals, affording excessive secre-

Union of Properties for the Dairy and the Stall.

tions of *bad milk*—thus not only prematurely exhausting the cow, by which they are given, but requiring great quantities of food for her support. That disease, peculiar tendency towards fatness or leanness, or copious supplies of thin, or lesser quantities of rich milk, or even the determination of a particular colour to any definite part of the body, as white at the end of a Devon's tail, may be established, by perseverance and art, every man conversant with the subject will readily believe. Because a Hollander chooses to wear out his cow, or have a race of animals, which will not readily become fat, even when dry, and the cupidity of the venders of milk, in the neighbourhood of large towns in England, or America, has led them to propagate for one object this unthrifty breed of cattle, is it to be inferred, that the efforts of Colling's *coadjutors* could not obtain, by crossing, a race adapted to the general purposes of the country—fitted, at different times for the production of *rich milk* and the *secretion of fat*?

Murray's System of Chemistry.—"The blood is a compound of this kind," &c.—"And if we suppose a fluid thus passing through tubes of different diameters, and undergoing successive decompositions, we may easily conceive that very different products may be formed from the same compound. This affords a simple view of the nature of secretion. No complicated apparatus is necessary for the performance of the change; all that is necessary being the propulsion of the blood through minute vessels capable of contraction. It has accordingly frequently been observed, that new products are formed without the intervention of glands; such is the formation of the fat or of muscular fibre. It is easy to conceive that the formation of these may take place in the extreme vessels where these products are deposited, and in like manner in the mere course of the circulation, may be formed the gluten, albumen, and other principles of the blood itself. From secretion a variety of products are formed, as the bile, milk, fat, the bony matter, the matter of membranes, and a variety of others. These complete the formation of animal matter, and comprehend its several varieties. Such are the different steps of the process of animalization. The food is digested in the stomach, mixed with animal matter in the intestinal canal, and converted into chyle; this mingles with the blood, and loses a portion of carbon in the lungs: in the extreme vessels it is converted into the general principles of animal matter, and in the glands, is converted into various secreted products."

White, on the Formation of the Digestive Organs of the Cow.—Vol. 4. chap. 1. page 13.—"The stomach then may be considered both as a muscular and as a vital organ. If we view it in another light, we shall consider it as one continued bibulous surface, sucking up the chyle as it is formed, and conveying it by means of the milk vessels, to the four receptacles which are named the quarters of the udder. There is another order of absorbent vessels in the stomach, and in the small intestines also, especially in the upper part, named lacteals, which ramify through the mesentery, and terminate in the thoracic duct, having previously passed through what are named the mesenteric glands; that is for the most part, for some are seen going over their surface. These lacteals are subsidiary, in their office, serving to convey chyle when the mesenteric glands are inflamed and obstructed. Chyle, as we find it in the lacteals, is exactly like milk in every respect, and is, in fact, the same thing. The fluid of the thoracic duct is different; it is semitransparent, has always a little oil floating on it, and is now and then found mixed with a little blood, which probably falls into it after death from the great vein in which it terminates. This depends on the valve of that part giving way, in consequence of death. Chyle and milk are then precisely the same thing, and in the cow there are three thoracic ducts, two going to the udder and conveying milk, and one to a great vein near the heart, conveying that fluid from which the blood is formed. When the animal has young, the lactiferous vessels, for so the minute branches of the two former thoracic ducts should be named, have a predominant aptitude to absorb the chyle, and a sufficient quantity only is taken up by the chyloferous vessels going to the third thoracic duct, to supply the heart."

AN ESSAY* ON THE QUESTION

“Whether the Breed of Live Stock, connected with Agriculture, be susceptible of the greatest Improvement from the qualities conspicuous in the Male, or from those conspicuous in the Female Parent?”

BY THE REV. HENRY BERRY, *Acton Beauchamp, Worcestershire.*

It will be acknowledged by every competent judge, that the question proposed by the Highland Society is one abounding in difficulties, but it is hoped that the facts and arguments, which will be hereafter used, will prove that the writer has bestowed upon the subject a considerable degree of attention, and that he has not presumed to intrude visionary opinions, unconfirmed by the test of experience, or adopted without the previous labour of investigation and reflection.

That the discovery of an *independent* faculty (if such exist) in the male or female parent, to confer peculiar properties on the offspring, would be attended with beneficial results to the breeders of animals connected with agriculture, must at once be admitted; and this impression, generally entertained, is probably one of the causes which have led to the assignment of such peculiar faculty to the sexes alternately, as circumstances have occurred which appear to justify such opinion. No fact is more notorious than this, that many breeders consider certain horses or mares to confer striking characteristic traits on their offspring. The same also is asserted respecting neat cattle, and it may be added, that such peculiarity is principally assigned to the male. In order that the writer may render more effective his arguments against the correctness of such opinion, it is purposed briefly to state what are conceived to be the circumstances which have led to its adoption, and to exhibit them in their true light—as not justifying the conclusions to which they have led.

During all periods since agriculture has obtained any considerable degree of attention, greater or less care, according to circumstances, has been paid to the different breeds of animals, whose improvement formed an important branch of

* The Highland Society of Scotland awarded Mr. Berry their Honorary Medal for his Essay on this subject; but as by the rules of the Society we could not avail ourselves of the Paper for our first Number, the Essay has been kindly rewritten for us, which circumstance will account for any literal variation, though the matter will be found the same.—*Editor.*

rural economy. An obvious consequence of this care, resulting scarcely less from a laudable degree of emulation, than from a desire of lucrative improvement, would be the production of an improved race of *males*; the male animal affording advantages superior to the female for the improvement of the species, inasmuch as he is available to a number of the latter, while the services of the female must be restricted to her single, or little more numerous produce of the year, as the case might be. Further, it may be observed, that in earlier times, as in the present, the majority of breeders would pursue their object of improvement with the less expensive and easily acquired herd of ordinary females, looking to the selected males for the accomplishment of their wishes. Few would possess mares calculated to breed a *stallion*, as few also would have a cow sufficiently good in quality to produce a bull for the improvement of stock. The ideas entertained respecting the requisites of a sire would probably be similar, and lead to the adoption of a general standard of excellence, towards which it would be required that each male should approximate, and thus there would exist, among what may be termed fashionable sires, a corresponding form and character, different and superior to those of the general stock of the country. This form and character, it may be observed, would in most instances have been *acquired by perseverance in breeding, from animals which possessed the important or fancied requisites*, and might therefore be said to be almost *confirmed* in such individuals. Under these circumstances, striking results would, doubtless, follow the introduction of such sires into a common stock; results which would induce superficial observers to remark, that individual sires possessed properties as *males*, which in fact were only assignable to them as *improved* animals. A horse of the foregoing description, bred from ancestors of qualities similar to his own, would impress his offspring strongly, the mares with which he bred possessing no *determinate* character or form, as regarded their descent, being the produce of heterogeneous connexion, of the co-mingling of perhaps a hundred different shapes, and consequently possessing no tendency to any one in particular. Further, the female's produce, one annually, would be presented too rarely to afford a conviction similar to that entertained in favour of the male, among whose numerous colts of the year, there must be, even by chance, a considerable number bearing his features. In these, and in similar circumstances, it seems not unreasonable to suppose that the opinion originated of our breeds of cattle being more susceptible of improvement from the male than from the female parent.

Breeding—High Blood—Importance and effects.

In the present day, effects of the same nature have produced the same opinions, and the highly improved state of some of our agricultural stock has contributed greatly to strengthen and confirm them. It is observable, however, that the assignment of this intrinsic property is not made now, so exclusively as formerly, to the male. The female has also obtained her advocates, who, without advancing any argument in support of their doctrine, maintain it nevertheless with considerable pertinacity. It is presumed that the cause of this partial change in public opinion may be easily assigned. To persons conversant with improved breeding, it is well known that of late years numerous sales have taken place of the entire stocks of celebrated breeders of *Sires*, and consequently that the females, valuable for such purpose, have passed into a number of hands. Unfortunately, persons, who have on these occasions become possessed of a fine female, have not always been equally successful with regard to a male; the high prices at which such animals have sold, having placed an impediment in their way; or a disposition to deem one step towards improvement adequate to the promotion of their views, having led them to remain contented with a measure, which, to a certain extent, would benefit their stocks; but which must also as certainly be considered a sacrifice of the high-bred female in question. Such persons have introduced a cow so acquired, to a bull, inferior in point of descent, and general good qualities; and the offspring has proved superior to the sire, by virtue of the dam's excellence, to which by certain degrees it would approximate; and thus has arisen an opinion that particular females, also, possessed the property of impressing their characteristics upon the offspring.

THAT HIGH BLOOD, OR, IN OTHER WORDS, THAT ANIMALS LONG AND SUCCESSFULLY SELECTED, AND BRED WITH A VIEW TO PARTICULAR QUALIFICATIONS, IMPRESS THEIR DESCENDANTS IN THE MANNER HERE INTIMATED, is a fact too well established in experience to be overthrown by any of the chance exceptions which may, no doubt, be taken against this, as well as against other rules; and **TO HIGH BLOOD** it is, that the writer ascribes the quality, whether in the male or female parent, which the Highland Society has been desirous to assign correctly; and he is not without a hope that it will be thought he has shown in as satisfactory a manner as a case, where much must depend on conjecture, will admit of, how it has happened that the opinions prevalent on this subject ever came to be entertained.

Breeding—Crossing—effects.

The next object will be to support his opinion by the evidence which certain facts present, as he thinks, conclusively in its favour.

The blood stallion, *Militiaman*, covered several seasons at Bromyard, in Herefordshire. His colts were generally of a chesnut colour, and partook in a striking degree of his peculiar form. He was consequently pointed out as a horse impressing his stock with his own characteristics; and instanced as a proof of the existence of this peculiarity in the male. But it should be remarked, that in no district, where a tolerable number of colts are bred, are worse mares to be found than around Bromyard. They are promiscuously and ill-bred, and deficient in good form and character. *Militiaman* is a chesnut horse, bred from a tribe also principally chesnut. Is it then surprising that this horse, crossed with mares destitute of characteristic features, and bred in such a manner as to possess no predisposition to any particular form or colour, should impress his colts with his own peculiarities, derived from breed, or particular descent? It is presumed that no other result could reasonably be anticipated.

Mr. John Heming, of Acton Beauchamp, Worcestershire, had for some years a stock of common Hereford cows, of red colour, with white faces, which uniformly produced calves of the same colour. To this stock Mr. Heming used a bull, of the improved breed, *one season only*. The consequence was, that the bull's marks, dark spots on the face, appeared in almost all his calves, and are prevalent in his descendants, to the present day. Mr. Heming's originals were indiscriminately collected, and deficient in breed or uniformity of characteristic, except in the white face. They were generally improved by the introduction of the well-bred bull; and his *breed*, it is suggested, manifested its influence by the manner in which he conferred his peculiar colour.

Mr. Woodward, of Birlingham, Worcestershire, purchased twelve deep-milking Yorkshire cows, without pretensions to breed, or disposition to fatten. With these cows he used a high-bred Hereford bull, and in the produce lost the disposition to milk, acquiring that of laying on fat. In a similar experiment with the same cows and another Hereford bull, in the following year, he experienced precisely the same results. Comment is hardly necessary on these strong cases.

The writer has been some years in possession of an improved breed of pigs, which are chiefly of a sandy or brown colour. His sows of this breed, crossed with common country boars, almost invariably produce litters of their own colour. Size only has been obtained by the cross. The same results have followed the use of his boars with country sows;

but the fact which speaks most forcibly for his argument is, that a litter of pigs from one of these half-bred sows, by a high-bred boar, he is now using, of a white tribe, are all white; blood thus strikingly evincing its efficacy in conferring characteristic traits.

The writer's brother was also lately in possession of well-bred pigs, whose peculiarity consisted in a short pricked ear. The produce of these pigs, when crossed with the large pend-eared swine of North Wales, was invariably similar in the ear to the better-bred animal, whether male or female.

Hitherto, the instances and arguments adduced have been confined to the structure, or external marks of animals, and if a satisfactory conclusion may be drawn respecting these, the question proposed by the Highland Society as to disposition, must be involved in it. A brief remark shall therefore suffice, offered more with a view to show that opinions are very erroneously entertained on this subject, than from a conviction that the proceeding is necessary.

The writer has known many tribes of animals disposed to break from their pastures, and has consequently heard it asserted that particular cows conferred the disposition on their offspring. Now, the fact is, this was no matter of *disposition* at all, but was a *consequence* of the animals in question having very thin hides, which rendered them impatient of heat and the attack of flies. It is thus too frequently that, for want of due attention, effects are ascribed to wrong causes.

To suppose that either the male or female parent possess an *independent inherent propensity* to impress their offspring, is to embarrass the pursuit of breeding in no trifling degree. Most persons can judge of the fitness of that proceeding which aims to improve the produce of an inferior animal by the introduction of one superior. That like will produce like, or, that, in ordinary instances, two good animals will breed a third good one, appears probable to every capacity, from a consideration of very common principles, notwithstanding admitted exceptions to general rules. But to suppose that an independent sexual ability exists in either male or female, appears calculated to unsettle the doctrines of skilful men, and to lead to the adoption, in their stead, of opinions unsupported by a reference to any known principles, leaving very important interests to the dangerous conduct of a blind guide.

If it could be proved that stock are more susceptible of improvement from the male parent, the question then would be, how is a male, possessing the requisites, to be obtained? Surely it will not be replied, that his being begotten by such a male would alone be sufficient, without the possession of excellence on the dam's side. It is possible that a good male

may beget a son equally good as himself in *externals*, from an ill-bred bad female, but it is certain that such son will prove comparatively an inferior stock-getter, it being an established fact that animals *breed back* in point of resemblance, and it is therefore considered necessary, for the object of improvement or to retain excellence, to have a pedigree as little dubious as possible, for several generations. SO IMPORTANT, INDEED, IS THIS FACT OF CORRECT DESCENT, THAT MANY BREEDERS, WHO HAVE, FROM CAUSES WHICH IT IS DIFFICULT TO ASCERTAIN, A WELL-BRED ANIMAL OF DEFECTIVE FORM, VENTURE TO USE HIM, RELYING ON HIS BLOOD, AND EXPERIENCE NO REASON FOR REGRET THAT THEY HAVE DONE SO. But what, in such circumstances, is the mode of proceeding? Is such male used indiscriminately to all the females, or is it considered necessary to check his tendency towards defective form, by good points counteracting in the females? Undoubtedly such care is taken, and thus the system of judiciously counteracting defects on either side, whether male or female, is successfully practised, in preference to one adopted on the belief of the existence of an independent sexual capability.

It has already been remarked, that the great improvement made during late years in our breeds of stock, has tended greatly to promote the agitation of the question at issue. This is easily accounted for. Various circumstances have combined to rouse the attention of farmers to the unprofitable state of their stocks. The consequence has been, that well-bred males have been resorted to, and the produce of the first cross has so far exceeded the most sanguine hopes, taking its character in *externals*, as well as in positive utility, in a great measure from the well-bred male, that new advocates for the opinion in his favour have thus been added to the number which previously existed.

A reference to the stock of any professional bull breeder would serve to show how erroneous is the opinion founded on such grounds. It would there be seen that, upon the whole, the produce of different years are subject to but little fluctuation in point of excellence, supposing the requisite skill to be practised by the breeder. The system of crossing the different males and females being correctly understood, and above all, *the females also being well-bred*, the standard of excellence is supported with tolerable uniformity; and though occasionally an extraordinary animal makes its appearance, none of the effects are apparent which excite surprise when the male only, or female, happens to be well-bred. Contrast this state of things with that which will be apparent in the infe-

Breeding—High Blood predominates.

rior stock, to improve which the well-bred bull is put in requisition. There it is that the produce astonishes, for there the sire impresses characteristics peculiarly his own. If it be inquired, why he does so? The answer is easy, for the reason is obvious. His excellencies are the accumulated acquisitions of many ancestors; they are positive, and in comparison fixed; while the cows, with which he has been used, possess little or no character, and have been bred without regard to any point, but the production of animals to increase the stock upon the farm.

It is conceived that a few facts in corroboration of this reasoning may be here appropriately introduced. They will be derived from the history of the Improved Short-Horns, a breed of cattle with which the writer happens to be best acquainted.

Mr. Colling's bull, *Comet*, impressed the generality of his stock with his own peculiar traits in so remarkable a degree, that it was easy for a stranger to select them from a great number of animals. But in *Comet*, it should be remembered, centered what was called the best blood, and it ought to be remarked, that, at that period, good short-horns were not very numerous; and *Comet*, except in his owner's and Mr. Charge's stocks, was introduced to cows comparatively inferior. It is not, therefore, singular that from such a bull a stock very superior to the dams should spring; but in Mr. Colling's own stock, where the cows were also superior, and in Mr. Charge's, to which the same remark applies, no such striking effects followed the use of this bull. The cows possessed positive characteristics, the effect of improved breeding, as well as *Comet*; and if his traits did predominate in a more than usual degree in the offspring, it was principally only where the cows bore a near affinity to him. The same remarks are applicable to *Major*, a son of *Comet*. With well-bred cows he proved himself a good bull, but it was when he came to be used with inferior cows that his excellence, as a stock-getter, was fully revealed; but his merit in this respect is well known. High breed here again predominated in the usual extraordinary manner, for *Major* was by *Comet* out of the celebrated Cow-Lady, all whose produce sold at prices so high, as strongly to evince how they were regarded in public estimation. Here then existed positive qualities, transmitted by descent, on the bull's side, before which the indeterminate character of ill-bred cows gave way; and it led to the production of a race better than the females, an improvement to be ascribed to *Major's* blood, and not to any sexual superiority. The same remarks may be made as to *Western Comet*, a son of *Major*, out of a capital cow of Mr. Charge's. All his stock were most excellent, but the

Pedigree must have the support of excellence.

bull's breeding was most pre-eminently evinced in his descendants from ordinary cows. Thus it appears that when a male and female are equally well bred, and of nearly equal individual excellence, it is not probable that their produce will exhibit any general proof of a preponderating power, in either parent, to impress peculiar characteristics. But should the contrary appear to be the case, upon diligent inquiry it will seldom fail to be ascertained, that peculiar characteristics have been derived from ancestors, which, under certain circumstances of contact or crossing, have become prominent features in the offspring. A simple case will illustrate this remark. Suppose the ancestors of a bull in the third or fourth generation, to have possessed defective shoulders, but that defect not to exist in himself, in consequence of close attention to this point on the part of his breeder. Cross such bull with a cow defective in her shoulders, and, probably, the defect will exist in the offspring in an increased degree, and will obtain for the dam the character of breeding a produce similar to herself. Whereas, in fact, this is an injudicious cross, made in ignorance or disregard of the facts that animals *breed back*; that they possess a greater tendency to defect than to perfection; and that the only safe mode of breeding is that of strictly scrutinizing the pretensions of ancestors.

With regard to the bulls which have been instanced, Comet, Major, and Western Comet; had they been bred from cows of very inferior blood, although they might have possessed excellent form, with other good qualities, experience assures us that they could not have deserved regard as *sires*. Comet's sons, from well-bred cows, begot good animals; but such as were descended from inferior females, left no reputation behind them, but as *sons of Comet*.

In order that the foregoing reasoning may be understood, and a very common and fatal error guarded against, it is thought necessary to explain, as to the terms *high-blood* and *highly-bred*, that the writer does not mean to attach unmerited value to mere pedigree, unsupported by solid pretensions to excellence; he would only recommend to public estimation, that long descent from animals all individually possessed of valuable qualities, which qualities are prominent in their descendants.

If what has been advanced shall appear to be founded in reason, then, it is submitted, that, with our present stock of information on this subject, one only rational course of proceeding can be adopted by breeders, viz. that of resorting to the best males; at once a simple and efficacious mode of improving such stocks as require improvement, and the sole mode by which stocks, already good, can be preserved in their excellence.

PEDIGREES

OF

MR. POWEL'S

Improved Durham Short-horn Cattle,

SELECTED EXPRESSLY FOR DAIRY PURPOSES;

BY MR. COATES,

The keeper of the Herd Book, and one of the oldest and most celebrated breeders in Great Britain,

To whom a standing order had been given to obtain the best animals, and without limitation as to price, when they could be procured from Mr. Whitaker's fold.

[The following animals can be traced in the Herd Book.]

MALCOLM,

Imported in 1825, calved in 1823 (bred by J. Whitaker, Esq.) got by Enchanter, dam Western Lady,* by WESTERN COMET; g. d. by Western Comet; gr. g. d. by Western Comet; gr. gr. g. d. by Western Comet; gr. gr. gr. g. d. Haughton.

Enchanter, light grizzle (bred by Mr. T. Bates) got by His Grace, dam Fairy (bred by Mr. Hustler) by Duke; g. d. OLD DAISY† by FAVOURITE, the sire of Comet; gr. g. d. by Punch; gr. gr. g. d. by HUBBACK.

Western Comet (bred by Mr. Charge) got by Mr. C. Colling's Major, dam Gentle Kitty, by Mr. Charge's Grey Bull; g. d. by FAVOURITE.

Hubback, calved in 1777 (bred by Mr. John Hunter) got by Snowden's Bull, dam (from the stock of Sir James Pennyman, and these from the stock of Sir William St. Quintin, of Scampston) by a bull of Mr. Banks of Hurworth; g. d. bought of Mr. Stephenson of Ketton.

His Grace (bred by Mr. Bates) got by Ketton the Second, dam DUCHESS the Second, by Ketton the First, g.

* Western Lady gave 28 quarts per day.

† Old Daisy gave 32 quarts per day.

Malcolm's Pedigree traced in the Herd Book

d. DUCHESS* the First (bred by Mr. C. Colling) by COMET; gr. g. d. by FAVOURITE; gr. gr. g. d. by Daisy Bull; gr. gr. gr. g. d. by FAVOURITE; gr. gr. gr. gr. g. d. by HUBBACK; gr. gr. gr. gr. gr. g. d. by JAMES BROWN'S RED BULL.

Duke, by COMET, dam DUCHESS by FAVOURITE; g. d. by DAISY; gr. g. d. by FAVOURITE; gr. gr. g. d. by Hubback; gr. gr. gr. g. d. by JAMES BROWN'S RED BULL.

Favourite, the sire of Comet, by Bolingbroke, dam PHOENIX by FOLJAMBE; g. d. FAVOURITE, by R. Alcock's Bull; gr. g. d. by Smith's Bull; gr. gr. g. d. by Jolly's Bull.

Punch (bred by Mr. R. Colling) got by Broken Horn, dam by Broken Horn; g. d. bred by Mr. Best.

Major (bred by Mr. C. Colling) got by Comet, dam LADY, by Grandson of Bolingbroke; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE (bred by Mr. Maynard) by R. Alcock's Bull.

Grey Bull (bred by Mr. Charge) got by FAVOURITE, dam Fleck'd Lady, by Young Bartle; g. d. First Lady, by Bartle; gr. g. d. Old Simmon, descended from the STUDLEY BULL.

Snowden's Bull (bred by Mr. George Snowden) got by Mr. William Robson's Bull (bred by Mr. Waistell, near Darlington) dam Barforth.

William Robson's Bull (or Waistell's Bull) got by Mr. James Masterman's Bull.

James Masterman's Bull (bred by Mr. Walker) got by the STUDLEY BULL.

* Mr. C. Colling remarked "the Duchess and Daisy tribes were all good milkers." (*Berry's Pamphlet*.)

Malcolm's Pedigree.

Ketton the Second, got by *Ketton the First*, dam by *Grandson* of *Favourite*; g. d. by Mr. James Brown's red bull.

Ketton the First, got by *FAVOURITE*; d. (g. d. of *OLD DUCHESS*) by the *Daisy Bull* (by *FAVOURITE*) g. d. by *FAVOURITE*; gr. g. d. by *HUBBACK*; gr. gr. g. d. by Mr. James Brown's red bull.

*COMET** (sold for 1000 guineas) red and white roan, calved in 1804 (bred by Mr. C. Colling) got by *Favourite*, dam *Young Phoenix*, by *FAVOURITE*; g. d. *Phoenix* by *Foljambe*; gr. g. d. *FAVOURITE*, (bred by Mr. Maynard) by Mr. R. Alcock's bull; gr. gr. g. d. by Mr. Jacob Smith's bull; gr. gr. gr. g. d. by Mr. Jolly's bull.

James Brown's red bull (bred by Mr. John Thompson of *Girlington Hall*) got by Mr. William Barker's bull.

Daisy bull (bred by Mr. C. Colling) got by *FAVOURITE*, dam by *PUNCH*; g. d. by *HUBBACK*.

Bolingbroke, red and white, calved Nov. 12, 1788 (bred by Mr. Charles Colling) got by *FOLJAMBE*, dam *Young Strawberry* (bred by Mr. Maynard) by *Dalton Duke*; g. d. *FAVOURITE* (bred by Mr. Maynard) by Mr. R. Alcock's Bull; gr. g. d. by Mr. Jacob Smith's Bull; gr. gr. g. d. by Jolly's bull.

Foljambe, white with a few red spots, calved in 1787 (bred by C. Colling) got by *Richard Barker's bull*, dam *Haughton*, the gr. gr. gr. gr. gr. g. d. of *Malcolm* (bred by Mr. Alexander Hall) by *Hubback*; g. d. by a bull of *Charles Colling*; gr. g. d. by *Waistell's bull*; gr. gr. g. d. *Tripes*, bred by C. Pickering.

* See Bailey's Survey of Durham, and Strickland's Survey of Yorkshire, for the British Board of Agriculture.

Gloucester's Pedigree traced in the Herd Book.

R. Alcock's bull, bred by Jackson.

Broken Horn, red roan, calved in 1787 (bred by Mr. R. Colling) got by HUBBACK, dam by HUBBACK; g. d. bred by Mr. Watson.

Grandson of Bolingbroke (bred by C. Colling) got by O'Callaghan's Son of Bolingbroke, dam Old Johanna, by Colling's *Lame Bull*.

Bartle (bred by Mr. Charge) got by Dalton Duke, dam descended from the *STUDLEY WHITE BULL*.

William Barker's bull, yellow, red, and white, got by Lakeland's son of the *STUDLEY BULL*.

Dalton Duke, red and white (bred by Mr. Charge) got by Mr. W. Dobson's bull, dam by the *STUDLEY BULL*.

Richard Barker's bull, sire of *FOLJAMBE*, calved in 1784, got by Mr. Hill's red bull, dam by a son of Lakeland's bull. Lakeland's bull by the *STUDLEY BULL*.

O'Callaghan's Son of Bolingbroke, red and white, got by Bolingbroke, dam a red poll'd Galloway cow.

Lame Bull (bred by Mr. George Best—got by James Brown's *White Bull*).

Hill's Red Bull, got by Brother of Dalton Duke, dam red cow.

James Brown's White Bull, got by Dalton Duke.

GLOUCESTER.

Imported July 1826, calved February 28, 1825 (bred by J. Whitaker, Esq.) by Frederick, dam *ADELA** (bred by Mr. Whitaker) by Orpheus; g. d. *ALFREDE*† (bred by Mr. Hustler) by *ALFRED*; gr. g. d. by Windsor; gr. gr. g. d. *OLD DAISY*‡ (bred by Mr.

* Adela gave with her first calf 24 quarts per day.

† Alfred gave 24 quarts per day.

(See the Rev. Henry Berry's Pamphlet.)

‡ Old Daisy gave 32 quarts daily.

Gloucester's Pedigree.

C. Colling) by FAVOURITE; gr. gr. gr. g. d. by Punch; gr. gr. gr. gr. g. d. by HUBBACK.

Frederick, roan (bred by Mr. Charge) got by Hulton, dam Orbit, by Comet; g. d. Splendor by Comet: gr. g. d. Flecked Twin by Major; gr. gr. g. d. Red Simmon by Favourite; gr. gr. gr. g. d. Flecked Simmon by Bartle; gr. gr. gr. gr. g. d. Old Simmon (bred by Mr. Charge) descended from the STUDLEY WHITE BULL.*

Orpheus (bred by Mr. Booth) got by Mr. C. Colling's Albion, dam by Lane Bull; g. d. by R. Colling's Swallow.

Alfred† (bred by Mr. C. Colling) got by COMET, dam VENUS by Ben; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE‡ (bred by Mr. Maynard) by R. Alcock's bull.

Windsor (bred by Mr. C. Colling) got by FAVOURITE, dam VENUS by Ben; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE, by R. Alcock's Bull; gr. gr. g. d. by Smith's Bull; gr. gr. gr. g. d. Strawberry, by Jolly's Bull.

Favourite, the sire of Comet, by Bolingbroke, dam PHOENIX by FOLJAMBE, g. d. FAVOURITE, by R. Alcock's bull; gr. g. d. by Smith's bull; gr. gr. g. d. by Jolly's bull.

Punch (bred by Mr. R. Colling) got by Broken Horn, dam by Broken Horn; g. d. bred by Mr. Best.

Hubback, calved in 1777 (bred by Mr. John Hunter) got by Snowden's bull, dam (from the stock of Sir James

* It is considered expedient to trace the pedigrees of the imported animals on the male side—hence, where the same males occur in subsequent pedigrees, repetition is unavoidable, to make the descent evident, to persons who are not familiar with the subject.

† For Alfred 200 guineas were refused,

‡ Favourite, the dam of Comet.

Gloucester's Pedigree.

Pennyman, and these from the stock of Sir William St. Quintin, of Scampston) by a bull of Mr. Banks of Hurworth; g. d. bought of Mr. Stephenson of Ketton.

Hulton (bred by Mr. Charge) got by Newton, dam Meteor by COMET; g. d. Best Twin, by FAVOURITE; gr. g. d. Flecked Simmon, by Bartle; gr. gr. g. d. Old Simmon.

COMET (sold for 1000 guineas) red and white roan, calved in 1804 (bred by Mr. C. Colling) got by Favourite, dam Young Phoenix, by FAVOURITE; g. d. PHOENIX by Foljambe; gr. g. d. FAVOURITE, (bred by Mr. Maynard) by Mr. R. Alcock's bull; gr. gr. g. d. by Mr. Jacob Smith's bull; gr. gr. gr. g. d. by Mr. Jolly's bull.

Major (bred by Mr. C. Colling) got by Comet, dam LADY by Grandson of Bolingbroke; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE (bred by Mr. Maynard) by R. Alcock's bull.

Bartle (bred by Mr. Charge) got by Dalton Duke, dam descended from the STUDLEY WHITE BULL.

STUDLEY WHITE BULL, got by the STUDLEY BULL, bred by Mr. Sharter of Chilton.

Albion, light roan, calved April 18, 1810 (bred by Mr. C. Colling, property of Mr. Booth); got by COMET, dam Beauty by Marske; g. d. Miss Washington.

Lame Bull (bred by Mr. Booth) got by Mr. Booth's Sir Henry, dam Old Gaudy, by Mr. R. Colling's Suwarrow; g. d. by Mr. Booth's Son of the Twin Brother of Ben; gr. g. d. by Twin Brother of Ben.

Suwarrow (bred by Mr. R. Colling) got by Styford, dam by Favourite.

Gloucester's Pedigree.

Ben, red, (bred by Mr. R. Colling) got by Punch; dam by Foljambe; g. d. by Hubback.

Foljambe, white with a few red spots, calved in 1787 (bred by C. Colling) got by Richard Barker's bull, dam Haughton (bred by Mr. Alexander Hall) by Hubback; g. d. by a bull of Charles Colling; gr. g. d. by Waistell's bull; gr. gr. g. d. Tripes, bred by C. Pickering.

R. Alcock's bull, bred by Jackson.

Bolingbroke, red and white, calved Nov. 12, 1788 (bred by Mr. Charles Colling) got by FOLJAMBE, dam Young Strawberry (bred by Mr. Maynard) by Dalton Duke; g. d. FAVOURITE (bred by Mr. Maynard) by Mr. R. Alcock's bull; gr. g. d. by Mr. Jacob Smith's bull; gr. gr. g. d. by Jolly's bull.

Broken Horn, red roan, calved in 1787 (bred by Mr. R. Colling) got by HUBBACK, dam by HUBBACK; g. d. bred by Mr. Watson.

Newton (bred by Mr. Charge) got by Comet, dam Fanny, by Mr. Charge's Grey bull; g. d. Lady Short-Tail by Johannot; gr. g. d. Second Lady by Favourite; gr. gr. g. d. First Lady by Bartle; gr. gr. gr. g. d. Old Simmon.

Grandson of Bolingbroke (bred by C. Colling) got by O'Callaghan's son of Bolingbroke, dam old Johanna, by Colling's Lame Bull.

Marske (bred by Mr. C. Colling) got by Favourite.

Sir Henry, red, (bred by Mr. Booth) got by Suwarrow, dam by Mr. Booth's son of the Twin Brother of Ben; g. d. by Twin Brother of Ben.

Twin Brother of Ben, red and white (bred by Mr. R. Colling) got by Punch, dam by Foljambe; gr. g. d. by Hubback.

Bolivar's Pedigree traced in the Herd Book.

Styford (bred by Mr. R. Colling) got by Favourite, dam by Punch; g. d. by Foljambe; gr. g. d. by Hubback.

Richard Barker's bull, sire of FOLJAMBE, calved in 1784, got by Mr. Hill's red bull, dam by a son of Lakeland's bull. Lakeland's bull by the STUDLEY BULL.

Dalton Duke, red and white (bred by Mr. Charge) got by Mr. W. Dobson's bull, dam by the STUDLEY BULL.

Grey Bull (bred by Mr. Charge) got by FAVOURITE, dam Fleck'd Lady, by Young Bartle; g. d. First Lady, by Bartle; gr. g. d. Old Simmon, descended from the STUDLEY BULL.

O'Callaghan's Son of Bolingbroke, red and white, got by Bolingbroke, dam a red poll'd Galloway cow.

Red Bull, got by brother of Dalton Duke, dam red cow.

Johannot (bred by C. Colling) got by Mr. C. Colling's Cupid:

Cupid, calved in 1799 (bred by Mr. C. Colling) got by Mr. C. Colling's Son of Favourite, dam Venus by Ben; g. d. Phœnix by Foljambe; gr. g. d. Favourite (bred by Mr. Maynard) by Alcock's bull.

BOLIVAR.

Imported Nov. 1826, calved May 5, 1825 (bred by J. Whitaker, Esq.) got by FREDERICK; dam Sweetheart by Hermit; g. d. Buxom by Lawnsleeves; gr. g. d. Brampton by FAVOURITE,* gr. gr. g. d. Bright Eyes by FAVOURITE; gr. gr. gr. g. d. Old Bright Eyes by FAVOURITE; gr. gr. gr. gr. g. d. by FAVOURITE; gr. gr. gr. gr. g. d. by Punch; gr. gr. gr. gr. g. d. by Hubback; gr. gr. gr. gr. gr. g. d. by SNOWDEN'S BULL; gr. gr. gr. gr. gr.

* Sire of Comet.

Bolívar's Pedigree.

gr. gr. gr. g. d. by Masterman's bull; gr. gr. gr. gr.
gr. gr. gr. gr. gr. g. d. by Waistell's bull; Waistell's
bull by Masterman's bull; Masterman's bull by the
STUDLEY BULL.

Frederick, roan (bred by Mr. Charge) got by Hulton, dam
Orbit by Comet; g. d. Splendour by Comet; gr. g.
d. Flecked Twin by Major; gr. gr. g. d. Red Sim-
mon by Favourite; gr. gr. gr. g. d. Flecked Simmon
by Bartle; gr. gr. gr. gr. g. d. Old Simmon (bred
by Mr. Charge) descended from the STUDLEY
WHITE BULL.

Hermit, roan (bred by Mr. Baker) got by Lawnsleeves, dam
Manuscript by Simon; g. d. by DAISY; gr. g. d. by
Duke; gr. gr. g. d. by Bolingbroke.

Lawnsleeves, got by C. Colling's Surplice; dam by George;
g. d. by Simon, out of Mr. Smith's old cow.

Favourite, the sire of Comet, by Bolingbroke, dam PHOENIX
by FOLJAMBE; g. d. FAVOURITE, by R. Alcock's
bull; gr. g. d. by Smith's bull; gr. gr. g. d. by
Jolly's bull.

Punch (bred by Mr. R. Colling) got by Broken Horn, dam
by Broken Horn; g. d. bred by Mr. Best.

Hubback, calved in 1777 (bred by Mr. John Hunter) got by
Snowden's bull, dam (from the stock of Sir James
Pennyman, and these from the stock of Sir William
St. Quintin, of Scampston) by a bull of Mr. Banks
of Hurworth; g. d. bought of Mr. Stephenson of
Ketton.

Snowden's bull, the sire of Hubback, bred by Mr. George
Snowden, got by Robson's bull.

Masterman's bull, by the STUDLEY BULL.

Waistell's bull by Masterman's bull.

Bolivar's Pedigree.

Simon, got by FAVOURITE, dam by Punch; g. d. by Bolingbroke.

Daisy bull (bred by Mr. C. Colling) got by FAVOURITE, dam by Punch; g. d. by HUBBACK.

Duke by COMET, dam DUCHESS* by FAVOURITE; g. d. by DAISY; gr. g. d. by FAVOURITE; gr. gr. g. d. by Hubback; gr. gr. gr. g. d. by JAMES BROWN'S RED BULL.

Bolingbroke, red and white, calved Nov. 12, 1788 (bred by Mr. Charles Colling) got by FOLJAMBE, dam Young Strawberry (bred by Mr. Maynard) by Dalton Duke; g. d. FAVOURITE (bred by Mr. Maynard) by Mr. R. Alcock's bull; gr. g. d. by Mr. Jacob Smith's bull; gr. gr. g. d. by Jolly's bull.

Surplice (bred by C. Colling) got by FAVOURITE, g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE, by Alcock's bull.

George (bred by Mr. C. Colling) got by COMET, dam LADY by Grandson of Bolingbroke; g. d. PHOENIX by Foljambe; gr. g. d. FAVOURITE (bred by Mr. Maynard) by Alcock's bull.

COMET (sold for 1000 guineas) red and white roan, calved in 1804 (bred by Mr. C. Colling) got by Favourite, dam Young Phoenix, by FAVOURITE; g. d. Phoenix by Foljambe; gr. g. d. FAVOURITE, (bred by Mr. Maynard) by Mr. R. Alcock's bull; gr. gr. g. d. by Mr. Jacob Smith's bull; gr. gr. gr. g. d. by Mr. Jolly's bull.

James Brown's red bull (bred by Mr. John Thompson of Girlington Hall) got by Mr. William Barker's bull.

* "From the Daisys, Duchesses and Wildairs, the best milkers have descended."

Lady Betty's Pedigree traced in the Herd Book.

Foljambe, white with a few red spots, calved in 1787 (bred by C. Colling) got by Richard Barker's bull, dam Haughton, the gr. gr. gr. gr. gr. g. d. of Malcolm (bred by Mr. Alexander Hall) by Hubback; g. d. by a bull of Charles Colling; gr. g. d. by Waistell's bull; gr. gr. g. d. Tripes, bred by C. Pickering.

R. Alcock's bull, bred by Jackson.

Grandson of Bolingbroke (bred by C. Colling) got by O'Callaghan's Son of Bolingbroke, dam Old Johanna, by Colling's Lane Bull.

LADY BETTY.

Imported in 1825 (bred by J. Whitaker, Esq.) calved in 1823; got by Alonzo, dam WILDAIR,* by R. Colling's Meteor; g. d. by Yarborough; gr. g. d. by Styford; gr. gr. g. d. by Hutton's bull, from JAMES BROWN'S BULL.

Alonzo, calved in 1821, got by Bates' Cleveland, dam RED DAISY* (bred by Mr. Hustler) by R. Colling's Major; g. d. by Windsor; gr. g. d. OLD DAISY by FAVOURITE; gr. gr. g. d. by PUNCH; gr. gr. gr. g. d. by HUBBACK.

Meteor (bred by R. Colling) by COMET, dam Diana by FAVOURITE; g. d. OLD WILDAIR by FAVOURITE; gr. g. d. by Ben; gr. gr. g. d. by HUBBACK; gr. gr. gr. g. d. by SNOWDEN'S BULL; gr. gr. gr. gr. g. d. by Sir James Pennyman's bull.

Yarborough (bred by Mr. C. Colling) got by Cupid, dam by FAVOURITE; g. d. by HUBBACK.

* Wildair and Red Daisy gave each 32 quarts per day. (See the Rev. Henry Berry's Pamphlet.)

Lady Betty's Pedigree.

Slyford (bred by Mr. R. Colling) got by Favourite, dam by Punch; g. d. by Foljambe; gr. g. d. by Hubback.

Hutton's bull, got by a son of Bolingbroke.

Cleveland, red and white, calved in 1819 (bred by, and the property of Mr. T. Bates) got by Ketton the Third, dam DUCHESS THE FIRST (bred by Mr. Colling) by COMET, g. d. by FAVOURITE; gr. g. d. by DAISY BULL; gr. gr. g. d. by FAVOURITE; gr. gr. gr. g. d. by HUBBACK; gr. gr. gr. gr. g. d. by James Brown's red bull.

Major, red and white, calved in 1813 (bred by Mr. R. Colling) got by Wellington, dam by Phenomenon; g. d. by FAVOURITE; gr. g. d. by FAVOURITE.

Windsor (bred by Mr. C. Colling) got by FAVOURITE, dam VENUS by Ben; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE, by R. Alcock's bull; gr. gr. g. d. by Smith's bull; gr. gr. gr. g. d. Strawberry by Jolly's bull.

Favourite, the sire of Comet, by Bolingbroke; dam PHOENIX by FOLJAMBE, g. d. FAVOURITE, by R. Alcock's bull; gr. g. d. by Smith's bull; gr. gr. g. d. by Jolly's bull.

Punch (bred by Mr. R. Colling) got by Broken Horn, dam by Broken Horn; g. d. bred by Mr. Best.

Hubback, calved in 1777 (bred by Mr. John Hunter) got by Snowden's bull, dam (from the stock of Sir James Pennyman, and these from the stock of Sir William St. Quintin of Scampston) by a bull of Mr. Banks of Hurworth; g. d. bought of Mr. Stephenson of Ketton.

COMET (sold for 1000 guineas) red and white roan, calved in

Lady Betty's Pedigree.

1804 (bred by Mr. C. Colling) got by Favourite, dam Young Phoenix, by FAVOURITE; g. d. Phoenix by Foljambe; gr. g. d. FAVOURITE, (bred by Mr. Maynard) by Mr. R. Alcock's bull; gr. gr. g. d. by Mr. Jacob Smith's bull; gr. gr. gr. g. d. by Mr. Jolly's bull.

Ben, red, (bred by Mr. R. Colling) got by Punch; dam by Foljambe; g. d. by Hubback.

Snowden's bull, got by Robson's bull; Robson's bull by Masterman's bull; Masterman's bull by the STUDLEY BULL.

Cupid, calved in 1799 (bred by Mr. C. Colling) got by Mr. C. Colling's Son of Favourite, dam Venus by Ben; g. d. Phoenix by Foljambe; gr. g. d. Favourite (bred by Mr. Maynard) by Alcock's bull.

O'Callaghan's Son of Bolingbroke, red and white, got by Bolingbroke, dam a red poll'd Galloway cow.

Ketton the Third, red and white (bred by Mr. Bates) got by Ketton the Second, dam DUCHESS the Third, by Ketton the First; g. d. DUCHESS the First (bred by Mr. C. Colling) by COMET; gr. g. d. by FAVOURITE; gr. gr. g. d. by DAISY BULL; gr. gr. gr. g. d. by FAVOURITE; gr. gr. gr. gr. g. d. by HUBBACK; gr. gr. gr. gr. g. d. by Mr. James Brown's red bull.

Daisy bull (bred by Mr. C. Colling) got by FAVOURITE, dam by PUNCH; g. d. by HUBBACK.

James Brown's red bull (bred by Mr. John Thompson of Girlington Hall) got by Mr. William Barker's bull.

Wellington, roan (bred by Mr. R. Colling) got by COMET; dam WILDAIR, by FAVOURITE; g. d. by Ben; gr.

Belina's Pedigree traced in the Herd Book.

g. d. by HUBBACK; gr. gr. g. d. by SNOWDEN'S BULL, the sire of HUBBACK; gr. gr. gr. g. d. by Sir JAMES PENNYMAN'S BULL.

Phenomenon (bred by Mr. R. Colling) got by FAVOURITE, dam by Ben; g. d. by HUBBACK; gr. g. d. by SNOWDEN'S BULL; gr. gr. g. d. by Sir James Pennyman's bull.

William Robson's bull by Mr. James Masterman's bull; Masterman's bull by the STUDLEY BULL.

Ketton the Second, got by Ketton the First, dam by Grandson of Favourite; g. d. by Mr. James Brown's red bull.

Ketton the First, got by FAVOURITE; d. (g. d. of OLD DUCHESS) by the Daisy Bull (by FAVOURITE) g. d. by FAVOURITE; gr. g. d. by HUBBACK; gr. gr. g. d. by Mr. James Brown's red bull.

BELINA,

Imported in 1825, (bred by J. Whitaker, Esq.) calved in 1822; got by Barmpton, dam by Son of Wellington, out of Charlotte; g. d. by Laird, &c.

Barmpton (bred by Mr. R. Colling) got by George, dam Moss Rose by FAVOURITE; g. d. Red Rose by FAVOURITE; gr. g. d. by Punch; gr. gr. g. d. by FOLJAMBE; gr. gr. gr. g. d. by HUBBACK.

Wellington, roan (bred by Mr. R. Colling) got by COMET, dam WILDAIR, by FAVOURITE; g. d. by Ben; gr. g. d. by HUBBACK; gr. gr. g. d. by SNOWDEN'S BULL, the sire of HUBBACK; gr. gr. gr. g. d. by Sir JAMES PENNYMAN'S BULL.

Laird, by Chieftain, dam OLD DUCHESS by DAISY BULL; g. d. by FAVOURITE; gr. g. d. by HUBBACK; gr. gr. g. d. by BROWN'S OLD RED BULL.

Yorkshire Belle's Pedigree traced in the Herd Book.

George (bred by Mr. R. Colling) got by FAVOURITE, dam Lady Grace by FAVOURITE.

Favourite, the sire of *Comet*, by Bolingbroke, dam PHOENIX by FOLJAMBE, g. d. FAVOURITE, by R. Alcock's bull; gr. g. d. by Smith's bull; gr. gr. g. d. by Jolly's bull.

Punch (bred by Mr. R. Colling) got by Broken Horn, dam by Broken Horn; g. d. bred by Mr. Best.

Foljambe, white with a few red spots, calved in 1787 (bred by C. Colling) got by Richard Barker's bull, dam Haughton, (bred by Mr. Alexander Hall) by Hubback; g. d. by a bull of Charles Colling; gr. g. d. by Waistell's bull; gr. gr. g. d. Tripes, bred by C. Pickering.

Hubback, calved in 1777 (bred by Mr. John Hunter) got by Snowden's bull, dam (from the stock of Sir James Pennyman, and these from the stock of Sir William St. Quintin, of Scampston) by a bull of Mr. Banks of Hurworth; g. d. bought of Mr. Stephenson of Ketton.

Chieftain (bred by Mr. Bates) got by Daisy bull.

Daisy bull (bred by Mr. C. Colling) got by FAVOURITE, dam by Punch; g. d. by HUBBACK.

James Brown's red bull (bred by Mr. John Thompson of Girlington Hall) got by Mr. William Barker's bull.

YORKSHIRE BELLE,*

Imported in 1825 (bred by J. Whitaker, Esq.) calved in 1824; by Frederick, dam Yarm,† by Symmetry;

* Yorkshire Belle gained the prize for yearlings at Otley Show, England.

† Yarm gave 24 quarts per day.

(See the Rev. Henry Berry's Pamphlet.)

Desdemona's Pedigree traced in the Herd Book.

g. d. by R. Colling's Meteor; gr. g. d. by Windsor;
gr. gr. g. d by Grey bull.

Frederick, roan (bred by Mr. Charge) got by Hulton, dam
Orbit by Comet; g. d. Splendour by Comet; gr. g.
d. Flecked Twin by Major; gr. gr. g. d. Red Sim-
mon by Favourite; gr. gr. gr. g. d. Flecked Simmon
by Bartle; gr. gr. gr. gr. g. d. Old Simmon (bred
by Mr. Charge) descended from the STUDLEY
WHITE BULL.

Meteor (bred by R. Colling) got by COMET, dam Diana
by FAVOURITE; g. d. OLD WILDAIR by FAVOUR-
ITE; gr. g. d. by Ben; gr. gr. g. d. by Hubback;
gr. gr. gr. g. d. by Snowden's bull; gr. gr. gr. gr. g.
d. by Sir James Pennyman's bull.

Windsor (bred by Mr. C. Colling) got by FAVOURITE, dam
VENUS by Ben; g. d. PHOENIX by FOLJAMBE; gr.
g. d. FAVOURITE, by R. Alcock's Bull; gr. gr. g. d.
by Smith's Bull; gr. gr. gr. g. d. Strawberry, by
Jolly's Bull.

Grey Bull, got by White bull, dam by Punch; g. d. by Fol-
jambe; gr. g. d. by Hubback.

White Bull, got by Favourite, dam by Favourite.

See Gloucester's pedigree, for

<i>Hulton</i> , the grandsire,	} of Yorkshire Belle.
<i>Comet</i> , the gr. g. sire, and gr. gr. g. sire,	
<i>Major</i> , the gr. gr. gr. g. sire,	
<i>Favourite</i> , the gr. gr. gr. gr. g. sire,	
<i>Bartle</i> , the gr. gr. gr. gr. g. sire,	}

DESDEMONA,

Imported in 1825 (bred by J. Whitaker, Esq.) calved
in 1824; by Frederick, dam Delia by Cleveland; g.

Desdemona's Pedigree.

d. RED DAISY* by Major; gr. g. d. by Windsor; gr. gr. g. d. by FAVOURITE; gr. gr. gr. g. d. by Punch; gr. gr. gr. gr. g. d. by HUBBACK.

Frederick, roan (bred by Mr. Charge) got by Hulton, dam Orbit, by Comet; g. d. Splendor by Comet: gr. g. d. Flecked Twin by Major; gr. gr. g. d. Red Simmon by Favourite; gr. gr. gr. g. d. Flecked Simmon by Bartle; gr. gr. gr. gr. g. d. Old Simmon (bred by Mr. Charge) descended from the STUDLEY WHITE BULL.

Cleveland, red and white, calved in 1819 (bred by and the property of Mr. T. Bates) got by Ketton the Third, dam DUCHESS the First (bred by Mr. C. Colling) by COMET, g. d. by FAVOURITE; gr. g. d. by DAISY BULL; gr. gr. g. d. by FAVOURITE; gr. gr. gr. g. d. by HUBBACK; gr. gr. gr. gr. g. d. by Mr. James Brown's red bull.

Major, red and white, calved in 1813 (bred by Mr. R. Colling) got by Wellington, dam by Phenomenon; g. d. by FAVOURITE; gr. g. d. by FAVOURITE.

Windsor (bred by Mr. C. Colling) got by FAVOURITE, dam VENUS by Ben; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE by R. Alcock's bull; gr. gr. g. d. by Smith's bull; gr. gr. gr. g. d. Strawberry, by Jolly's bull.

Favourite, the sire of Comet, by Bolingbroke, dam PHOENIX by FOLJAMBE; g. d. FAVOURITE, by R. Alcock's bull; gr. g. d. by Smith's bull; gr. gr. g. d. by Jolly's bull.

* Red Daisy gave 32 quarts per day. (See the Rev. Henry Berry's Pamphlet.)

Volante's Pedigree traced in the Herd Book.

Punch (bred by Mr. R. Colling) got by Broken Horn, dam by Broken Horn; g. d. bred by Mr. Best.

Hubback, calved in 1777 (bred by Mr. John Hunter) got by Snowden's bull, dam (from the stock of Sir James Pennyman, and these from the stock of Sir William St. Quintin, of Scampston) by a bull of Mr. Banks of Hurworth; g. d. bought of Mr. Stephenson of Ketton.

See Gloucester's pedigree, for

<i>Hulton</i> , the grandsire,	} of Desdemona.
<i>Comet</i> , the gr. g. sire, and gr. gr. g. sire,	
<i>Major</i> , the gr. gr. gr. g. sire,	
<i>Favourite</i> , the gr. gr. gr. gr. g. sire,	
<i>Bartle</i> , the gr. gr. gr. gr. g. sire,	

VOLANTE.

Imported in July 1826 (bred by J. Whitaker, Esq.) calved February, 1825; got by Frederick, dam Viola* by His Grace; g. d. Venust† (bred by Mr. Charge) by Charles Colling's Major; gr. g. d. Venus by Grey bull; gr. gr. g. d. by FAVOURITE.

Frederick, roan (bred by Mr. Charge) got by Hulton, dam Orbit by Comet; g. d. Splendor by Comet; gr. g. d. Flecked Twin by Major; gr. gr. g. d. Red Simmon by Favourite; gr. gr. gr. g. d. Flecked Simmon by Bartle; gr. gr. gr. gr. g. d. Old Simmon (bred by Mr. Charge) descended from the **STUDLEY WHITE BULL**.

His Grace (bred by Mr. Bates) got by Ketton the Second, dam DUCHESS the Second, by Ketton the First, g.

* Viola took the prize at Otley Show, England.

† Venus, when sixteen years old, gave 26 quarts per day. (See the Rev. Henry Berry's Pamphlet.)

Annabella's Pedigree traced in the Herd Book.

d. DUCHESS the First (bred by Mr. C. Colling) by COMET; gr. g. d. by FAVOURITE; gr. gr. g. d. by Daisy Bull; gr. gr. gr. g. d. by FAVOURITE; gr. gr. gr. g. d. by HUBBACK; gr. gr. gr. gr. g. d. by JAMES BROWN'S RED BULL.

Major (bred by Mr. C. Colling) got by Comet, dam LADY, by Grandson of Bolingbroke; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE (bred by Mr. Maynard) by R. Alcock's Bull.

Grey Bull (bred by Mr. Charge) got by FAVOURITE, dam Fleck'd Lady, by Young Bartle; g. d. First Lady, by Bartle; gr. g. d. Old Simmon, descended from the STUDLEY BULL.

Favourite, the sire of Comet, by Bolingbroke, dam PHOENIX by FOLJAMBE; g. d. FAVOURITE, by R. Alcock's Bull; gr. g. d. by Smith's Bull; gr. gr. g. d. by Jolly's Bull.

See Gloucester's pedigree for

<i>Hulton</i> , the grandsire,	} of Volante.
<i>Comet</i> , the gr. g. sire, and gr. gr. g. sire,	
<i>Major</i> , the gr. gr. gr. g. sire,	
<i>Favourite</i> , the gr. gr. gr. g. sire,	
<i>Bartle</i> , the gr. gr. gr. gr. g. sire,	

ANNABELLA,

Imported in July, 1826, got by Peter (bred by Mr. Booth) dam Attraction (bred by Col. Trotter) by Pyramus; g. d. Aurora by COMET, gr. g. d. Marcella by Son of FAVOURITE; gr. gr. g. d. by Son of FAVOURITE; gr. gr. gr. g. d. Hollon.

Peter (bred by Mr. Booth) got by R. Colling's Pilot, dam by Marshal Beresford; g. d. by Shakspeare; gr. g. d. by Old Easby; gr. gr. g. d. by Suwarrow.

Annabella's Pedigree.

Pyramus (bred by Col. Trotter) got by COMET, dam Anna Maria, by Grandson of Favourite; g. d. Strawberry by Son of Favourite; gr. g. d. Hollón.

COMET. (See Malcolm's pedigree.)

Favourite. (See Malcolm's pedigree.)

Pilot, red and white, calved in 1817 or 18 (bred by Mr. R. Colling) got by Major; dam Red Rose by FAVOURITE; g. d. by Punch; gr. g. d. by FOLJAMBE; gr. gr. g. d. by Hubback.

Marshal Beresford (bred by Major Bower) got by Comet, dam DAISY; (bred by Mr. C. Colling) g. d. OLD DAISY; gr. g. d. by Punch; gr. gr. g. d. by HUBBACK.

Shakspeare (bred by Mr. Booth) got by Easby; dam by Mr. Colling's Suwarrow; g. d. by Mr. Booth's Son of the Twin Brother of Ben; gr. g. d. by Twin Brother of Ben.

Easby, roan (bred by Mr. Booth) got by Mr. Colling's Suwarrow, dam Fareholme, by Mr. Booth's Son of the Twin Brother of Ben; g. d. by Twin Brother of Ben; gr. g. d. by Twin Brother of Ben.

Suwarrow. (See Gloucester's pedigree.)

Major. (See Betty's pedigree.)

Wellington. (See Betty's pedigree.)

Punch. (See Malcolm's pedigree.)

Hubback. (See Malcolm's pedigree.)

Twin Brother of Ben. (See Gloucester's pedigree.)

Ben. (See Gloucester's pedigree.)

Snowden's bull, the sire of Hubback (bred by Mr. George Snowden) got by Mr. William Robson's bull.

Robson's bull by Masterman's bull.

Stately's Pedigree traced in the Herd Book.

Masterman's bull by the Studley bull (bred by Mr. Sharter of Chilton).

STATELY.

Imported in 1822, calved in 1821 (bred by Mr. Wetherell) got by North Star, dam Laura by Denton; g. d. Selina, by Wellington; gr. g. d. by Danby.

North Star, roan (bred by Mr. Wetherell) got by COMET, dam Lady (bred by Mr. Spours) by Baronet (bred by Mr. Mason); g. d. by Cripple; gr. g. d. by Irishman.

Denton (bred by Mr. Wetherell) got by COMET, dam Young Red Rose, by St. John; g. d. by Trunnell; gr. g. d. by Danby.

Wellington (bred by Mr. Wetherell) got by St. John, dam by Trunnell; g. d. by Danby.

Danby (bred by Mr. Wetherell) got by Paddock, dam by White bull.

Comet. (See Malcolm's pedigree.)

Baronet, roan, got by Chilton, dam Lydia by Favourite; g. d. Nell by Mr. Mason's white bull; gr. g. d. Fortune (bred by Mr. C. Colling) by Bolingbroke; gr. gr. g. d. by Foljambe; gr. gr. gr. g. d. by Hubback; gr. gr. gr. g. d. bred by Mr. Maynard.

Cripple, red and white, (bred by Mr. Mason) got by Irishman, dam Fortune, by Bolingbroke; g. d. by FOLJAMBE; gr. g. d. by HUBBACK; gr. gr. g. d. bred by Mr. Maynard.

Irishman (bred by Mr. Mason) got by Styford, dam Fortune (bred by Mr. C. Colling) by Bolingbroke; g. d. by FOLJAMBE; gr. g. d. by HUBBACK; gr. gr. g. d. bred by Mr. Maynard.

Stately's Pedigree.

St. John, roan (bred by Mr. Mason) got by FAVOURITE; dam Fortune, (bred by Mr. C. Colling) by Bolingbroke; g. d. by Foljambe; gr. g. d. by HUBBACK; gr. gr. g. d. bred by Mr. Maynard.

Trunnell (bred by Mr. Mason) got by FAVOURITE, dam Fortune by Bolingbroke; g. d. by FOLJAMBE; gr. g. d. by HUBBACK; gr. gr. g. d. bred by Mr. Maynard.

Paddock (bred by Mr. James Brown) got by Mr. Robert Charge's bull (descended from the Studley breed), dam Mr. James Brown's red cow.

White bull. (See Malcolm's pedigree.)

Chilton, roan, (bred by Mr. Mason) got by FAVOURITE, dam Lily by FAVOURITE; g. d. Miss Lax (bred by Mr. Maynard), by Dalton Duke; gr. g. d. Lady Maynard, by Alcock's bull.

Favourite. (See Malcolm's pedigree.)

Mr. Mason's white bull (bred by Mr. C. Colling) got by FAVOURITE, dam FAVOURITE (bred by Mr. Maynard) by Alcock's bull; g. d. by Smith's bull; gr. g. d. by Jolly's bull.

Bolingbroke. (See Malcolm's pedigree.)

Foljambe. (See Malcolm's pedigree.)

Hubback. (See Malcolm's pedigree.)

Studley bull. (See Gloucester's pedigree.)

Simon. (See Bolivar's pedigree.)

Dalton Duke. (See Malcolm's pedigree.)

R. Alcock's bull. (See Malcolm's pedigree.)

STATELY'S OFFSPRING.

Defiance, bull, calved in 1824, by Bishop, dam Stately.

Raymond, white and roan, bull, calved in 1825, by Wye Comet, dam Stately.

Pocahontas, white and roan, heifer, calved in 1826, by Malcolm, dam Stately.

VIRGINIA,

Calved in 1821, begotten by General, dam Rosemary (bred by J. C. Curwen, Esq.) by Flash; g. d. Red Rose by Petrarch; gr. g. d. by Alexander; gr. gr. g. d. by Traveller; gr. gr. gr. g. d. by Son of Bolingbroke.

General (bred by General Simson) got by Young Star; dam Queen by Bruce; g. d. Empress by WESTERN COMET; gr. g. d. Bright Eyes by Marquis; gr. gr. g. d. by Simon; gr. gr. gr. g. d. by Traveller; gr. gr. gr. g. d. by Colling's Lane bull.

Flash (bred by Mr. Seymour) by Mr. Colling's Sir Dimple; dam Carnation (bred by Mr. Seymour) by Cripple; g. d. Moss Rose by Henry; gr. g. d. Rosebud by Misfortune; gr. gr. g. d. Red Rose by FAVOURITE; gr. gr. gr. g. d. by Bolingbroke.

Petrarch (bred by Mr. Charles Colling) by Comet, dam VENUS by Ben; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE by Alcock's bull; gr. gr. g. d. by Smith's bull; gr. gr. gr. g. d. Strawberry, by Jolly's bull.

Alexander (bred by Mr. Charles Colling) by FAVOURITE.

Traveller, got by Bolingbroke, dam Old Blossom.

Young Star, got by C. Colling's North Star, dam Mary (bred by C. Colling) by FAVOURITE; g. d. Venus by Ben.

Bruce, got by Jupiter, dam Rola.

Western Comet. (See Malcolm's pedigree.)

Marquis, got by Petrarch, dam by DAISY BULL; g. d. by FAVOURITE; gr. g. d. by HUBBACK.

Simon. (See Bolivar's pedigree.)

Virginia's Pedigree.

Colling's Lame bull. (See Malcolm's pedigree.)

Sir Dimple (bred by Mr. C. Colling) got by COMET, dam DAISY, by Grandson of FAVOURITE; g. d. OLD DAISY by FAVOURITE; gr. g. d. by PUNCH; gr. gr. g. d. by HUBBACK.

Cripple (bred by Mr. Mason) got by Irishman, dam Fortune (bred by Mr. C. Colling) by Bolingbroke; g. d. by FOLJAMBE; gr. g. d. by HUBBACK; gr. gr. g. d. bred by Mr. Maynard.

Henry (bred by Mr. Mason) got by St. John, dam Dandy by FAVOURITE; g. d. Lily by FAVOURITE; gr. g. d. Miss Lax (bred by Mr. Maynard) by Dalton Duke; gr. gr. g. d. Lady Maynard, by Mr. R. Alcock's bull.

Misfortune, got by FAVOURITE.

Favourite. (See Malcolm's pedigree.)

Bolingbroke. (See Malcolm's pedigree.)

Comet. (See Malcolm's pedigree.)

Ben. (See Gloucester's pedigree.)

Foljambe. (See Malcolm's pedigree.)

Alcock's bull. (See Malcolm's pedigree.)

North Star (bred by Mr. C. Colling) got by FAVOURITE, dam YOUNG PHOENIX by FAVOURITE; g. d. PHOENIX by FOLJAMBE; gr. g. d. FAVOURITE (bred by Mr. Maynard) by Alcock's bull.

Petrarch (bred by Mr. C. Colling) got by COMET, dam VENUS by Ben; g. d. PHOENIX by FOLJAMBE, gr. g. d. FAVOURITE (bred by Mr. Maynard) by Alcock's bull.

Daisy bull. (See Malcolm's pedigree.)

Hubback. (See Malcolm's pedigree.)

Burley's and Shepherdess' Pedigrees.

VIRGINIA'S OFFSPRING.

Monk, red roan, bull, calved in 1824, by Bishop, dam Virginia.

Ohio, white and red roan, bull, calved in 1825, by Wye Comet, dam Virginia.

Osage, light roan, bull, calved in 1826, by Wye Comet, dam Virginia.

SHEPHERDESS.

Imported in 1822; (bred by Mr. Champion) got by Magnet, dam by Prince; g. d. by a bull of the Duke of Leeds.

Magnet, got by Warrior, dam Magdalene (bred by Mr. C. Colling) by COMET; g. d. by Washington.

SHEPHERDESS' OFFSPRING.

Blyth, bull, calved in 1824, by Champion, dam Shepherdess.

Romp, heifer, calved in 1825, by Bishop, dam Shepherdess.

Florian, red and white, bull, calved in 1826, by Wye Comet, dam Shepherdess.

BURLEY.

Calved in February, 1826, white (bred by Mr. Powell) begotten in England by Frederick, dam Belina by Barmpton (bred by R. Colling) g. d. by Son of Wellington out of Charlotte; gr. g. d. by Laird.

Barmpton, roan, calved in 1810 (bred by Mr. R. Colling) got by Mr. R. Colling's George, dam Moss Rose by FAVOURITE; g. d. Red Rose by FAVOURITE; gr. g. d. by Punch; gr. gr. g. d. by FOLJAMBE; gr. gr. gr. g. d. by HUBBACK.

George (bred by Mr. R. Colling) got by FAVOURITE, dam Lady Grace by FAVOURITE.

Chieftain (bred by Mr. T. Bates) got by Daisy bull.

For *Frederick*, *Wellington*, *Laird*, *Favourite*, *Punch*,

Fairy's, Bishop's, and Wye Comet's Pedigrees.

Foljambe, Hubback, James Brown's red bull, and Daisy, see the foregoing pedigrees.

FAIRY,

Calved in 1820, got by Young Denton, dam Prize by Young Denton, g. d. Buckhorn.

Young Denton, got by Denton, dam by Baronet, g. d. by Cripple; gr. g. d. by Irishman.

Denton, got by Comet; g. d. by St. John; gr. g. d. by Old Danby.

Comet, Fairy's gr. g. sire. (See Bolivar's pedigree.)

FAIRY'S OFFSPRING.

Coquette, white, heifer, calved in 1824, by Bishop, dam Fairy.

Margaret, dark roan, heifer, calved in 1825, by Bishop, dam Fairy.

Richard, light roan, bull, calved in 1826, by Wye Comet, dam Fairy.

James, white, bull, calved in 1826, by Malcolm, dam Fairy.

Daphne, dark roan, heifer, calved in 1826, by Wye Comet, dam Coquette.

BISHOP,

Now possessed by J. Worth, Esq. (bred by Mr. Curwen in England, got by Wellington, dam Arbutus (bred by Mr. Gibson) by Harlequin; g. d. by Yarborough; gr. g. d. by Duke; gr. gr. g. d. by Jobling's Traveller; gr. gr. gr. g. d. by Bolingbroke.

WYE COMET,

(Now possessed by Henry Watson, Esq. Conn.) begotten in England, by Blaize, dam White Rose by Warrior; g. d. by Mr. Mason's Charles; gr. g. d. by Prince; gr. gr. g. d. by Neswick.

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